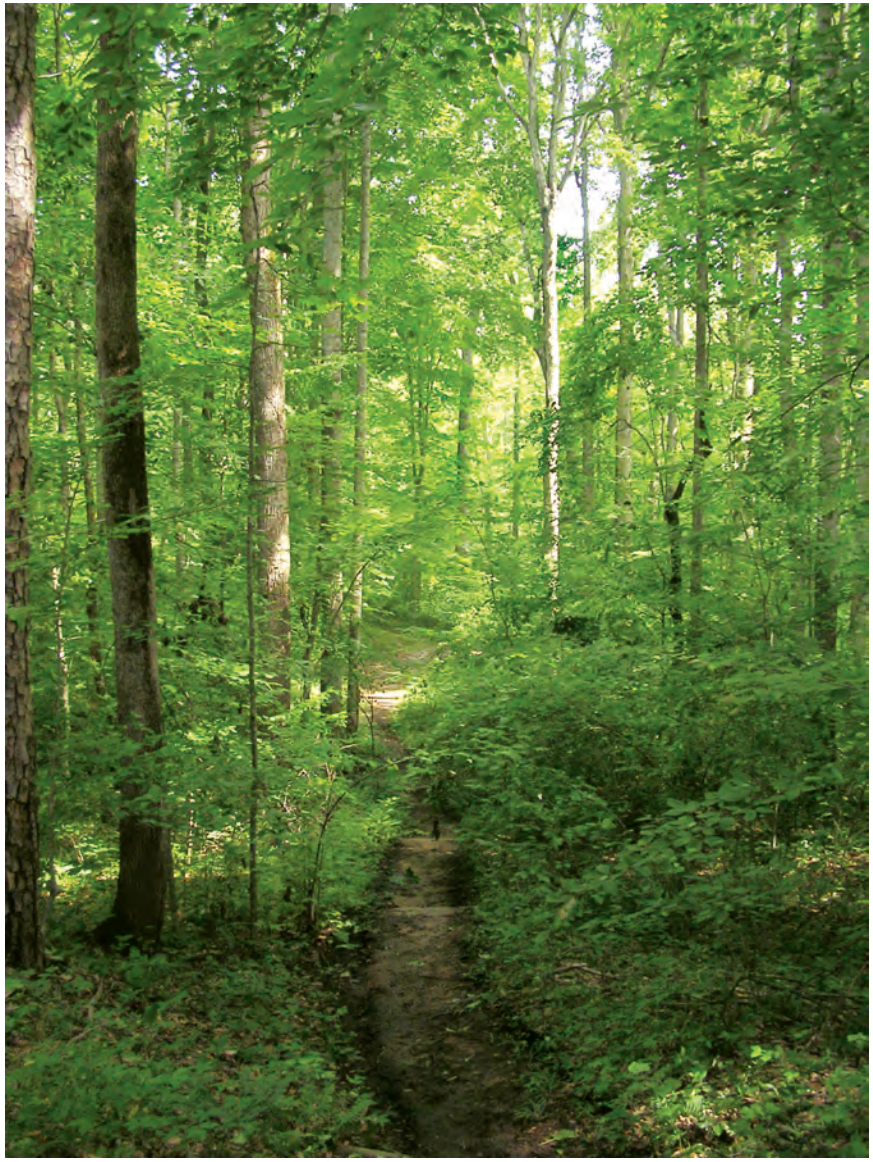


HAW RIVER STATE PARK
Master Plan

April 2010

Division of Parks and Recreation
Department of Environment and Natural Resources
North Carolina

Document prepared by:
Swanson and Associates, P.A.
Carrboro, N.C.

Contents

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Beverly Eaves Perdue, Governor Lewis R. Ledford, Director Dee Freeman, Secretary

Greetings to friends and supporters of Haw River State Park.

Haw River State Park was authorized in 2003, one of the first created through the New Parks for a New Century initiative. Its natural resource base is the headwaters of the Haw River, one of central North Carolina's most vital river systems, and the park is located near one of the state's largest population centers.

The fortunate acquisition of conference facilities from the Episcopal Diocese – which immediately began serving as The Summit Environmental Education Center – was quickly followed by the addition of undeveloped property, including 692 acres from Bluegreen Corp. in 2007. Throughout this acquisition process, the state park has enjoyed remarkable public support from the General Assembly, stakeholders, local governments and the local community.

The prospect of developing traditional state park amenities alongside a busy environmental education and training center called for a master plan to guide our course. In essence, a master plan is a blueprint for the long-term development of facilities and recreation opportunities and for protection of natural resources. Such a plan should be an organic document that evolves as the park grows and knowledge is gained about the resources and public use. It is also frequently at this point that a state park's character begins to take shape. Its purpose and goals are clearly defined, and its identity crystallizes

With this new master plan, Haw River State Park enters a new phase that will help us realize the vision of our partnership with supporters of the park, the local community and generations of future visitors. Swanson and Associates, P.A., a Carrboro-based landscape architecture firm, developed this plan in full consultation with state park staff and with the community, through a public meeting and comment period. The result is a long-range, attainable plan that balances recreation opportunities with our overriding mission as stewards of this remarkable natural resource.

At all our state parks, we are committed to our mission of protecting natural resources, educating our visitors about those resources and providing quality outdoor recreation opportunities. Haw River State Park offers us an outstanding opportunity to realize those goals. That commitment, the continued support of our partners and thoughtful planning will combine for a lasting legacy.

Sincerely,

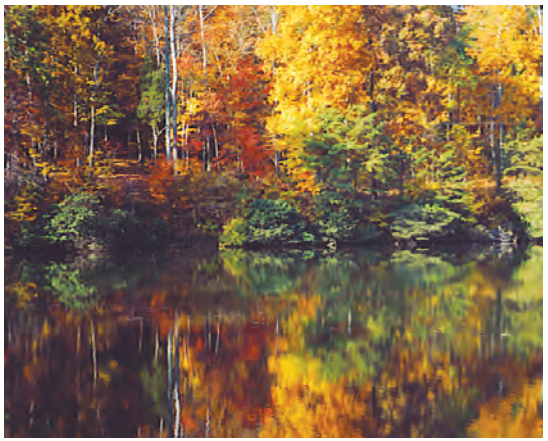
Lewis R. Ledford

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 • FAX: 919-715-3085 • Internet: www.ncparks.gov

exe Cutive suMMar y

Haw River State Park is situated along the Haw River in its headwaters region in the northern Piedmont Province of North Carolina. The park lies on the shared boundary of Rockingham and Guilford counties, north of the city of Greensboro, and is a key destination on the state's Mountains-to-Sea Trail. The length of river in the park and vicinity is defined by relatively broad floodplains for the region as well as significant lengths of wetland stretching along the river corridor. Several high quality natural communities in and around the park property also distinguish the park with a number of diverse scenic experiences within short distances from one another including piedmont oak-hickory forest, floodplain swamp, and early successional field

The park was authorized by the General Assembly of North Carolina for addition to the state parks system in 2003. In 2005, the N.C. Division of Parks and Recreation purchased and took possession of the Summit Episcopal Center, a retreat and conference center formerly owned by the Episcopal Diocese. This facility is now operated as The Summit Environmental Education Center, the first residential environmental education center operated by the N.C. Division of Parks and Recreation. The park has since grown in size with the assistance of public and private conservation partners, adding several other parcels of land to bring the current park holdings to 1,374 acres.



r obins n est l ake in autumn

The general study area for this master plan was identified between U.S. 29 to immediately west of Witty Road, and generally bounded on the north by U.S. 158 and to the south by N.C. 150. The intent of the N.C. Division of Parks and Recreation is to manage Haw River State Park as one park with two components, these being: 1) the greater park, to serve traditional park uses, educational programs, and connection to state and regional trails including the Mountains-to-Sea Trail and 2) The Summit Environmental Education Center, to continue as a center for environmental education, conference center, and training facility within the greater area of the park.

The park's primary interpretive themes are connecting with nature and the value of wetlands along the headwaters of the Haw River. Secondary interpretive themes include astronomy, cultural history, "green practices" and sustainable living, and wildlife and plants of Piedmont forests. Additional secondary themes may be developed in the future as the park grows.

w etlands at Haw r iver s tate Park

A thorough site inventory and analysis was performed as a component of this planning process. Through this process, the project consultant and other stakeholders in the park gained a better understanding of the opportunities and constraints within the park and how these might influence land conservation and protection of natural resources, site planning and development of new and improved facilities that will support the current interpretive themes.

The master plan for Haw River State Park provides for further conservation and protection of the Haw River's unique lands and natural resources while establishing a blueprint for long-term development of park facilities, recreation, and environmental education opportunities.

The master plan proposes specific project opportunities relating to traditional park uses primarily on an area of existing park property noted in the master plan as the Church Street Section. The plan for this area of the park includes circulation and access elements, a visitor center, day use areas including picnic shelters and trailheads, group camping areas, a looped hiking trail system, and facilities for maintenance and operations functions, among others.

The master plan proposes the expansion of The Summit Environmental Education Center from its current campus toward the east. Interim public day use access is proposed on this eastern portion of the park property to provide public access to the park until proposed day use facilities can be completed on property to the west of The Summit Environmental Education Center. The plan also makes specific recommendations for improving and expanding existing facilities, improving pedestrian safety and experience, as well as establishment of new facilities to support the mission of environmental education. These include expanded indoor and outdoor covered facilities, including an environmental education building, multi-use covered shelter, and a small-scale observatory, among others.

great spangled fritillary

Through the planning process, existing park land holdings were evaluated and judged inadequate to support all of the full conservation and recreational program of use for the park. Some facilities, therefore, are considered land-dependent at this time. These include tent-and-trailer camping, backpack camping, potential multi-use trails, and regional trail connections. A detailed protection plan indicates additional land desirable for the park to meet recreation and conservation goals into the future.

Since planning is a dynamic process, the availability of more detailed information over time may result in a final built product that is different than that depicted in this plan. This plan presents a balanced approach for a clear development plan and guide for future activities and recreational opportunities. It also seeks to meet the mission of the state parks system to conserve and protect the park's significant resources and provide for environmental education opportunities about the natural heritage of this park.

summary of Master Planning Process

Master Planning Process

The purpose of a master plan is to serve as a guide for protection and development of park resources. It includes an analysis of cultural, scenic, recreational, geologic, and natural resources as well as site analyses and development recommendations. It also considers public demand.

State Parks System Mission Statement

The North Carolina State Parks system exists for the enjoyment, education, health and inspiration of all our citizens and visitors. The mission of the state parks system is to conserve and protect representative examples of the natural beauty, ecological features and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide environmental educational opportunities that promote stewardship of the state's natural heritage.

For any state park, careful planning is crucial to balancing recreational demands with protection of the state's valuable natural resources. In essence, the master plan is a strategy for long-term development of facilities and recreation opportunities, and for protection of a park's natural resources.

The landscape architecture firm Swanson and Associates, P.A. of Carrboro, N.C. served as the design consultant for preparation of the master plan. A part of the consultant's mission was to examine the park as a whole and evaluate opportunities and constraints for new facilities. Swanson and Associates, P.A. explored ways to provide public access to park resources and recreation opportunities, connect the park to other existing and proposed regional trail systems, and improve environmental education opportunities and walkability at the existing Summit Environmental Education Center (The Summit).

The consultant performed a thorough site inventory and analysis in order to fully understand the opportunities and limitations offered by Haw River State Park. The consultant also analyzed usage trends for the park based on visitation logs kept by park staff.

The *North Carolina Outdoor Recreation Plan 2009-2013*, prepared by the N.C. Division of Parks and Recreation, also was reviewed. This plan addresses the problems, needs, and opportunities related to public outdoor recreation in North Carolina based on input from public meetings, a national survey summarized by the state, and an inventory of public outdoor recreation areas and facilities in the state. Table 1 is a condensed summary of the *2002-2007 National Survey on Recreation and the Environment* discussed in Chapter II of the *Outdoor Recreation Plan*. Of the outdoor recreation activities with the highest priority ranking, the following appear to be compatible with the natural resources of Haw River State Park: walking for pleasure; view/photo natural scenery; picnicking; view/photo wildlife, wildflowers, trees, birds; visit a primitive area; day hiking; and camping.

Concurrently, the consultant worked with N.C. Division of Parks and Recreation staff and other stakeholders to refine a program of use for the park. The master plan was developed in response to this program of use and the park opportunities.

The master plan is based upon the best mapping data available at the time of its preparation (See Resources and References). This data is not survey quality; therefore, more detailed soil, geotechnology, topographic, floodplain, wetland, ecological and other studies may be warranted in future phases of design in order to fully assess feasibility. Since planning is a dynamic process, the availability of more detailed information over time may result in a final built product that is di ferent than that depicted in this plan.

Community input Process

Park neighbors, representatives from local governments and other agencies, and members of the general public were invited to participate in a public meeting on October 20, 2009. The meeting took place at the Haw River State Park from 6:00 p.m. to 8:00 p.m.

t able 1: Percentage of n orth Carolina r esidents Participating in o utdoor r ecreation a ctivities

Summary of the 2002-2007 National Survey on Recreation and the Environment (N.C. Division of Parks and Recreation, 2008)

rank	activity	Percent
1	Walk for pleasure	82
2	Family gathering	74.6
3	Gardening or landscaping	65.4
4	Driving for pleasure	58.2
5	View/photo natural scenery	57
6	Visit nature centers, etc.	52.9
7	Sightseeing	52.9
8	Picnicking	50
9	Attend sports events	48.6
10	Visit a beach	44.2
11	Visit historic Sites	43.1
12	View/photo other wildlife	43
13	View/photo wildflowers, trees	41
14	Swimming in an outdoor pool	39.9
15	Swimming in lakes, streams, etc.	39.7
16	Yard games, e.g., horseshoes	38.5
17	View/photograph birds	34
18	Bicycling	31
19	Boating (any type)	31
20	Freshwater fishing	30.9
21	Attend outdoor concerts, plays, etc.	30.6
22	Visit a primitive area	29.8
23	Day hiking	29.7
24	Running or jogging	28.3
25	Visit a farm	28.2
26	View/photograph fish	26.5
27	Gather mushrooms, berries, etc.	26.3
28	Warmwater fishing	25.9
29	Visit other waterside (not a beach)	24.4
30	Motorboating	22.5
31	Boat tours or excursions	21.7
32	Drive off-road (any type)	20.7
33	Developed camping	20.5
34	Visit archeological sites	18
35	Snow/ice activities (any type)	17.9
36	Saltwater fishing	17
37	Mountain biking	15.7
38	Tennis outdoors	14.8
39	Primitive camping	14.6
40	Golf	13.9

The meeting was attended by approximately 119 people, including 15 N.C. Division of Parks and Recreation staff and three staff from Swanson and Associates, P.A.

The meeting included a presentation of the proposed improvements, maps and renderings of the park. Staff and design consultants were available to answer questions. Comments about the plan were accepted at the meeting and afterward by letter, e-mail, telephone and numerous individual conversations.

Revisions to the master plan maps were made after careful consideration of public comments received. These maps were posted on the N.C. Division of Parks and Recreation website for additional public review.

All comments received during the community input process were thoroughly evaluated and considered through this master plan process. A summary of all comments received through this process is appended to this document (see Appendix A).

r esulting Capital Projects

All proposed capital projects in the state parks system are individually scored and assigned priority before being added to a statewide capital improvements list. These priorities are periodically re-evaluated. This will be the case for new infrastructure (roads, utilities, etc.), facilities, or trails at Haw River State Park. The time frame for building new facilities will depend on how each new project is evaluated and scored in relation to other state park projects.

Generally, funding for park development comes from the Parks and Recreation Trust Fund, created in 1994 and supported by a portion of the state's tax on real estate deed transfers. The Parks and Recreation Authority, an appointed body, allocates money for capital projects and land acquisition after considering recommendations from the N.C. Division of Parks and Recreation.

Haw r iver s tate Park Master Plan
Public information Meeting, o ctober 2009

Haw r iver s tate Park Master Plan
Public information Meeting, o ctober 2009

Property a cquisitions

Land acquisition objectives for Haw River State Park include protecting water quality and natural resources, buffering these resources and visitor activities, protecting scenic views, providing land for park facilities and recreational opportunities, and improving park operations. Properties that contain or buffer rare species, natural communities, high water quality, and natural features are given the highest priority. Protecting the natural heritage areas and wetlands along the Haw River is especially important at Haw River State Park.

Data and surveys from the N.C. Division of Parks and Recreation, N.C. Natural Heritage Program, local governments, and N.C. Center for Geographic Information State Clearinghouse have been used to identify land in need of protection. Where park land suitable for potential facility development is not currently available, the master plan includes alternates dependent on additional property. The general study area for this master plan was identified between U.S. 29 to immediately west of Witty Road, and generally bounded on the north by U.S. 158 and to the south by N.C. 150.

The N.C. Division of Parks and Recreation works in conjunction with the State Property Office to acquire propert . Each transaction with a landowner is unique and includes an independent appraisal and approval by the Joint Legislative Committee on Governmental Operations and Council of State. Funding for land acquisition generally comes from the Parks and Recreation, Natural Heritage, and/or Clean Water Management trust funds. The Parks and Recreation Trust Fund is described in more detail in the State Parks Act included in Appendix B.

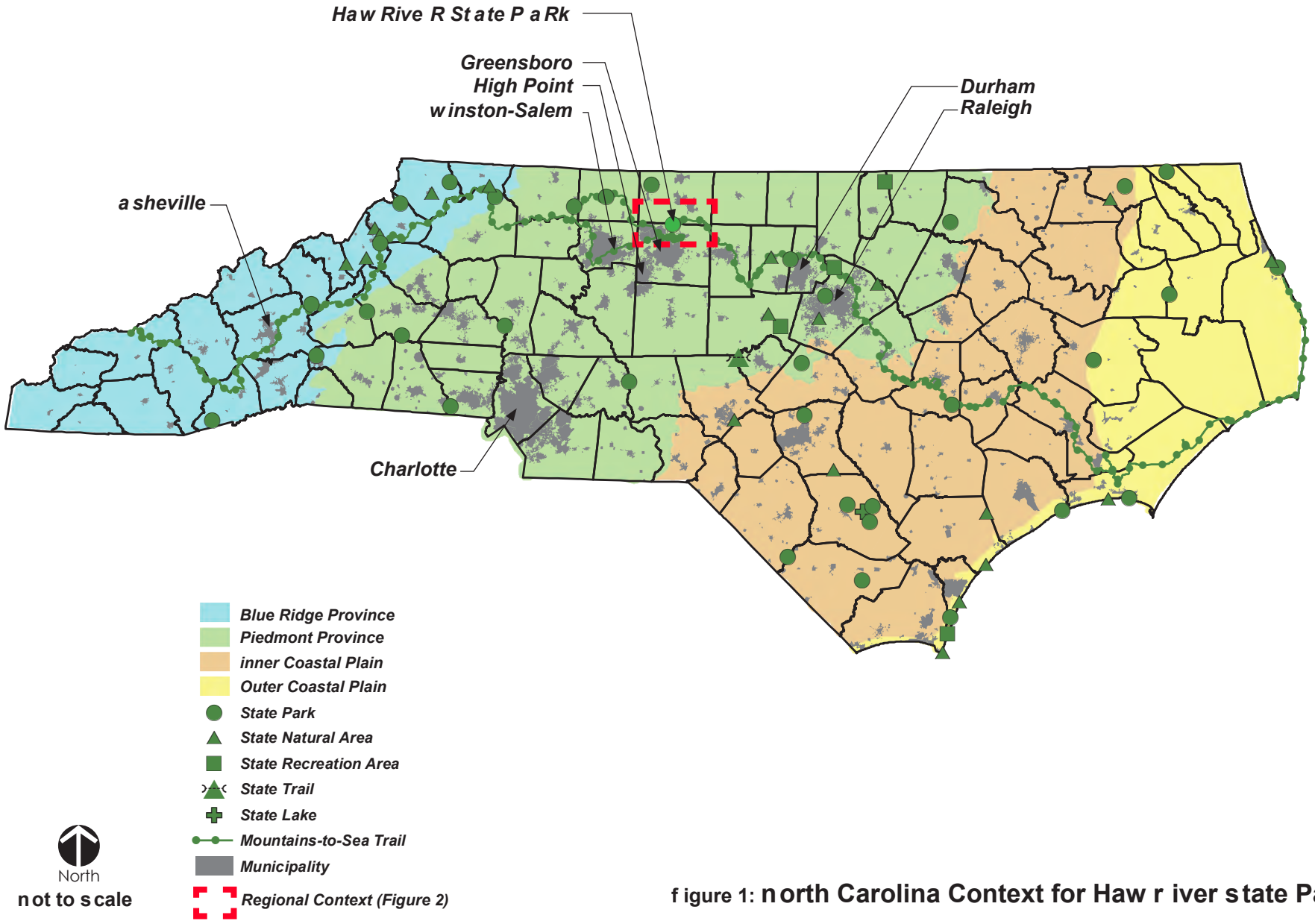


figure 1: north Carolina Context for Haw river state Park

site Context and Hist or y

site description

Haw River State Park consists of 1,374 acres situated in the Piedmont Province of North Carolina (Figure 1). The common boundary of Rockingham and Guilford counties extends through the park (Figure 2). The park is located within a relatively short driving distance of the large metropolitan cities of Greensboro, Winston-Salem, and High Point as well as other medium-sized towns.

Figure 2 also indicates the Extra-Territorial Jurisdictions (ETJ) for surrounding cities. In North Carolina, the ETJ denotes a planning boundary, that in many cases is used to plan for future annexation. The park property* is located, by the most direct route, about 4.1 miles to Reidsville to the northeast, 1.0 miles to Summerfield to the southwest, and 1.5 miles to the northernmost boundary of Greensboro to the south.

Haw r iver in vicinity of park

The park is situated along the Haw River. Though the source of the Haw River is located farther to the west just over the border in Forsyth County, this upper portion of the river is considered part of the headwaters region. The length of river in the park and vicinity is defined by relatively broad floodplains for the region as well a significant lengths of wetlands stretching along the river corrido .

Historic agricultural use and logging have left their evidence on the land, including old roads, some relatively large eroded gullies, and remnant field furrows

Several high quality natural communities have been identified within the park boundaries and its vicinity. These distinguish the park with a number of diverse scenic experiences within short distances from one another including piedmont oak-hickory forest, floodplain swamp, and early successional field. The predominant natural canopy vegetation in the park varies from flood tolerant species such as red maple, sycamore, and river birch in the lowlands, to beech, tulip tree, and white oak outside of the floodplains and wetlands.

t ributary of the Haw r iver

Cultural r esources

(*research by Jenny Kimmel and Ben Parsons, Haw River State Park Environmental Education Instructors*)

Haw River State Park and its surroundings hold evidence of a long history of human interaction with the land in this area from prehistoric occupations, to Revolutionary War activity, to Quaker establishments, to ushering of slaves toward freedom via the Underground Railroad.

Some prehistoric archaeological sites containing lithic and ceramic artifacts have been noted within the park boundaries and its immediate surroundings. The sites are small, suggesting that many occupations were practiced there, but with limited activity. One site contained deposits from multiple periods of occupation spanning thousands of years. No evidence exists to date of habitation or burial sites, although the potential exists for them on the property.

Successive cultures inhabited the Piedmont from 12,000 years ago until shortly after colonization of the Americas began. Disease, especially smallpox, killed many. War with neighboring tribes and environmental pressures from settlers also reduced their numbers.

* Based on ownership as of March 2010.

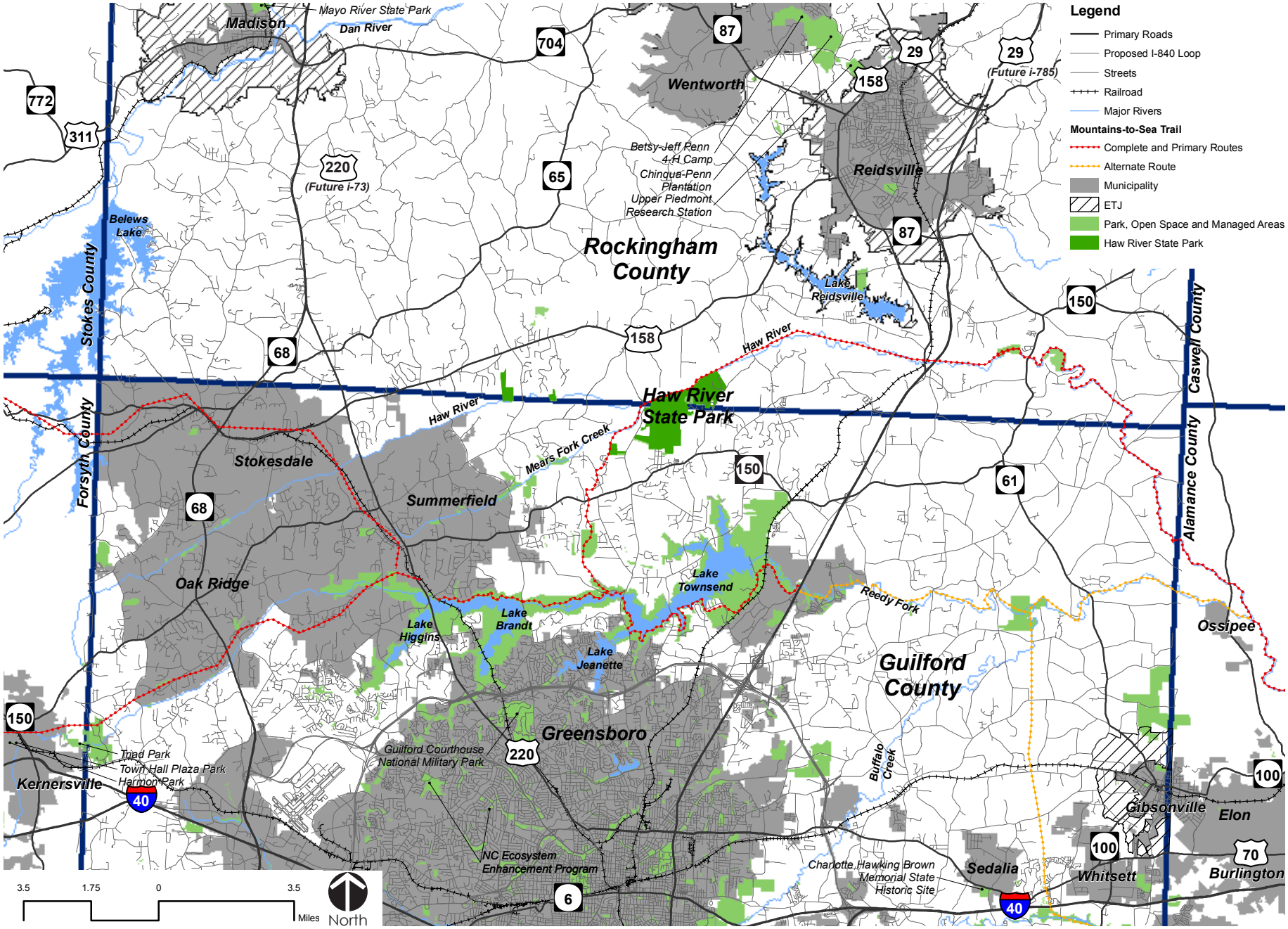


figure 2: Haw r iver s tate Park r egional Context

l og shed

t he l odge at t he s ummit

The Piedmont separated the Tuscarora Tribe to the coastal east and the Cherokee Tribe to the mountainous west of North Carolina. During the 1540s, Spanish explorers led by Hernando de Soto discovered many Native American groups living in the interior Piedmont regions of Carolina. The Native Americans whom de Soto met included Siouan, Iroquoian and Muskogean speakers. Their descendants are now recognized as the historic tribes of the Catawba, Cherokee and Creek Indians.

The Haw (Hau) River name is thought to have origins in the Eastern Sioux language group. The English botanist, John Lawson, crossed the river in 1701. He was the first to call it the "Hau River" for the "Sissipahau Indians who dwell upon this stream" (Lefler 1967:60).

Some of the first European settlers in Guilford County came down the Great Wagon Road from Pennsylvania rather than inland from the coastal plains of North Carolina. They included English Quakers, who settled along the Haw and Eno Rivers in the late 1700s. Other early Piedmont settlers were primarily Scottish-Irish and German people who were descendants of earlier Pennsylvania, Maryland, and Virginia settlers.

The Ironworks on Troublesome Creek, also called Speedwell Furnace, operated from 1770 until after World War II, during which it was reconstructed and sold numerous times. It housed furnaces for smelting iron, the operation of gristmills, sawmills and blacksmith shops, and the operation of a store. Some deep pits found on park property suggest that the area was mined for iron ore for the Ironworks.

During the Revolutionary War, the Ironworks site was used as a campsite by Continental Army General Nathanael Greene and his troops. It is not known if state park property was involved in any Revolutionary War activities.

During the colonial period some Africans also came to the Piedmont, usually as slaves accompanying their masters from other areas. Most of the settlers in the Piedmont were small farmers and did not own slaves, but as wealth grew, slavery became more common.

Because of the large Quaker population within the Haw River watershed (Guilford, Alamance, and Northwest Chatham counties), the Underground Railroad was very active and had many stations. Many Quakers were abolitionists and helped usher slaves to freedom in the north. Much is still unknown today about the exact routes used on the Underground Railroad, yet due to the park property's northern orientation in such close proximity to the Guilford College community, it is likely that escaping slaves traveled through what are now parts of the park. The river likely served as an important landmark and guide.

In the 19th Century, the Haw River and its tributaries powered grist mills for many communities that developed alongside these waterways. The remains of several mills, some in close proximity to state park property, are not uncommon along the Haw River.

Haw River State Park lies within the township of Browns Summit. The town supposedly is named after Jesse Brown (born in 1816) who traveled on the railroad connecting Reidsville and Greensboro. The railroad, built during the Civil War and completed in 1864, brought denser settlement to the region, ultimately putting it on the map. Trees from the area now known as The Summit were logged for use in the construction of the railroad.

Portions of the Haw River State Park property once were farmed. Most also was previously timbered. A log hunting lodge / fox camp stood on the property until the 1970s, when it burned. The N.C. State Historic Preservation Office surveys show a notation regarding interest in one of the barns on the southeast corner of the park property near Spearman Road; however, the property was not studied for historical importance and no action has been taken by the office on this structure. No other buildings on the park property have been studied for historical importance. Several buildings in the study area have been studied, but no further action has been taken on these buildings and they currently are not listed in the National Register of Historic Places*.

Historic aerial photographs for the park and surroundings from various years between 1938 and 1988 show fairly similar land uses over time, including predominantly open agricultural land and forest area. Some of these areas more recently have been converted into residential development (based on 2007/2008 aerial photos of the area).

Dr. Robert Phillips, a prominent neurosurgeon of Greensboro, donated a sizeable portion of his land in Browns Summit to the Episcopal Diocese of North Carolina in 1977. The Summit Episcopal Center, also known as The Summit, was constructed in 1981 (Hinds, 2003). The Diocese established an environmental education program at The Summit in the early 2000s, and continued to run this retreat and conference center until 2005, when it was purchased by the N.C. Division of Parks and Recreation.

Land acquisition History

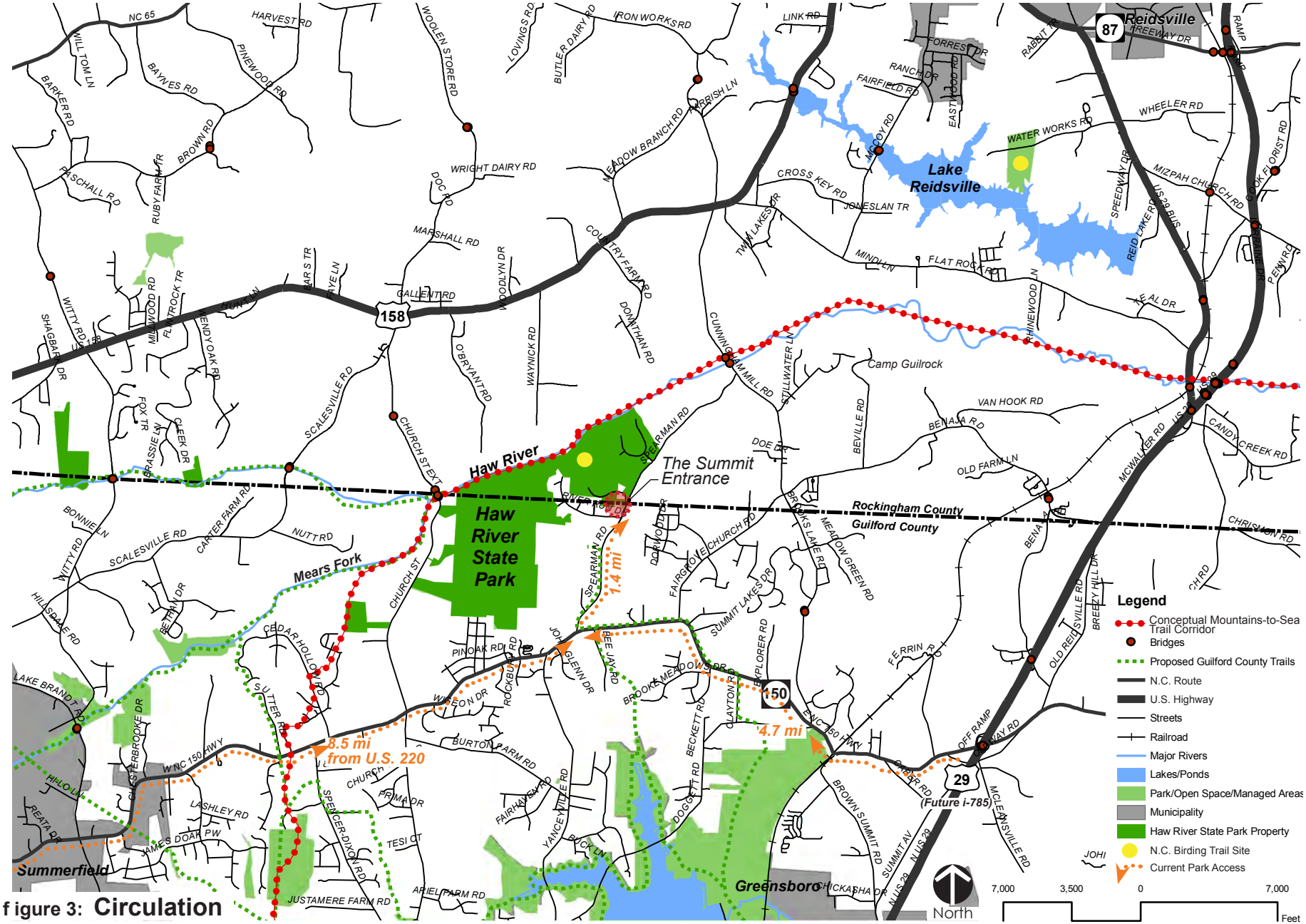
In the *Guilford County Open Space Report*, adopted by both the Guilford County Parks and Recreation Commission and the Board of Commissioners in 2000, the community first endorsed a proposal for a Cape Fear River headwaters state park to be located in the upper Haw River watershed in the county. In 2001, the Guilford County Open Space Committee officially nominated the Haw River corridor as a location for a state park in the county. In 2002, the New Parks for a New Century Initiative of the N.C. Division of Parks and Recreation identified the upper Haw River area as an area of interest for a state park, largely because of its notable wetland communities, including what may be the largest complex of beaver ponds in the Piedmont. The site was also selected because of its geographical location in an underserved area of the state and as a key component of the Mountains-to-Sea Trail.

On May 21, 2003, based on the identification that "the Haw River in Guilford and Rockingham counties supports a large collection of wetlands, high quality upland forests, and rare plant and animal species and possesses biological, archaeological, and scenic resources of statewide significance...," the General Assembly of North Carolina ratified an act to authorize the addition of Haw River State Park to the state parks system.

Later in 2003, the first acquisition for the state park was made. In 2005, the N.C. Division of Parks and Recreation purchased and took possession of the Summit Episcopal Center, a retreat and conference center formerly owned by the Episcopal Diocese. It is now operated as The Summit Environmental Education Center.

Beginning with that first acquisition, the park has grown in size with the assistance of public and private conservation partners, adding several other parcels of land to bring the current park holdings to 1,374 acres. The general study area for this master plan was identified between U.S. 29 to immediately west of Witty Road,

* According to the N.C. State Historic Preservation Office, actions by the N.C. Division of Parks and Recreation are subject to state preservation laws and regulations. Older properties may require further investigation for eligibility to the National Register prior to any action that could impact their integrity.



f igure 3: **Circulation**

and generally bounded on the north by U.S. 158 and to the south by N.C. 150.

Circulation / accessing the Park

Access to the park / study area is primarily on U.S. 29 from the north and south, and U.S 158 and N.C. 150 from the east and west. The entrance to The Summit is along Conference Center Drive off Spearman Road. This entrance is located 1.4 miles north of N.C. 150, 6.1 miles west of U.S. 29 (future Interstate 785), and 9.9 miles east of U.S. 220 (future Interstate 73). Figure 3 illustrates circulation patterns in and around the park.

The park property also is bounded by Church Street (SR 1001A). Guilford County will require any new primary access to the park to provide ingress and egress from a collector street or higher, which limits access points to current park property to Church Street or Spearman Road.

access into the summit

state and regional trail systems and open space Planning

Many opportunities for connections between Haw River State Park and other local, county, and state trail initiatives exist. Existing and proposed open space and trails are diagrammed in Figure 3.

North Carolina's Mountains-to-Sea Trail (MST) is a unit of the State Parks System that spans the state, linking Clingman's Dome in the Great Smoky Mountains National Park to Jockey's Ridge State Park on the Outer Banks. The trail is about half completed. Haw River State Park is a key destination on the trail and an important component of several regional connecting loops in the Piedmont. The park forms a core from which the trail will grow upstream and downstream along the Haw River, south to Lake Townsend and into Greensboro, and west toward Winston-Salem and Hanging Rock State Park The proposed trail plan is illustrated in Figures 3 and 4.

Haw River State Park also is a destination on the North Carolina Birding Trail, Central Piedmont section. The trail is intended to link great bird watching sites and birders with communities, businesses and other local historical and educational attractions. The trail guide notes the diverse bird attracting habitats of Haw River State Park including piedmont oak-hickory, floodplain swamp, and early successional field. Species of particular interest to birders include kinglet, brown creeper, wood duck, mallard, woodpecker, blue jay, red-shouldered hawk, blue heron, and song sparrow. One other nearby Birding Trail destination, Lake Reidsville Recreational Park, is noted in Figure 3.

Haw River State Park is intended as a destination on the proposed Haw River Trail. The mission of the Haw River Trail is "to develop a 110-mile land and water-based trail from the headwaters of the Haw River, west of Greensboro, to its confluence with the Deep River, south of Jordan Lake." It is intended to preserve natural habitat and protect water quality while providing a recreational, natural, and historical resource linking the Triad with the Triangle. This trail is planned as a multi-use trail that will link Haw River State Park to Jordan Lake State Recreation Area about 70 miles to the south. Due to limited access to navigable waters, paddling access in and around Haw River State Park is not anticipated.

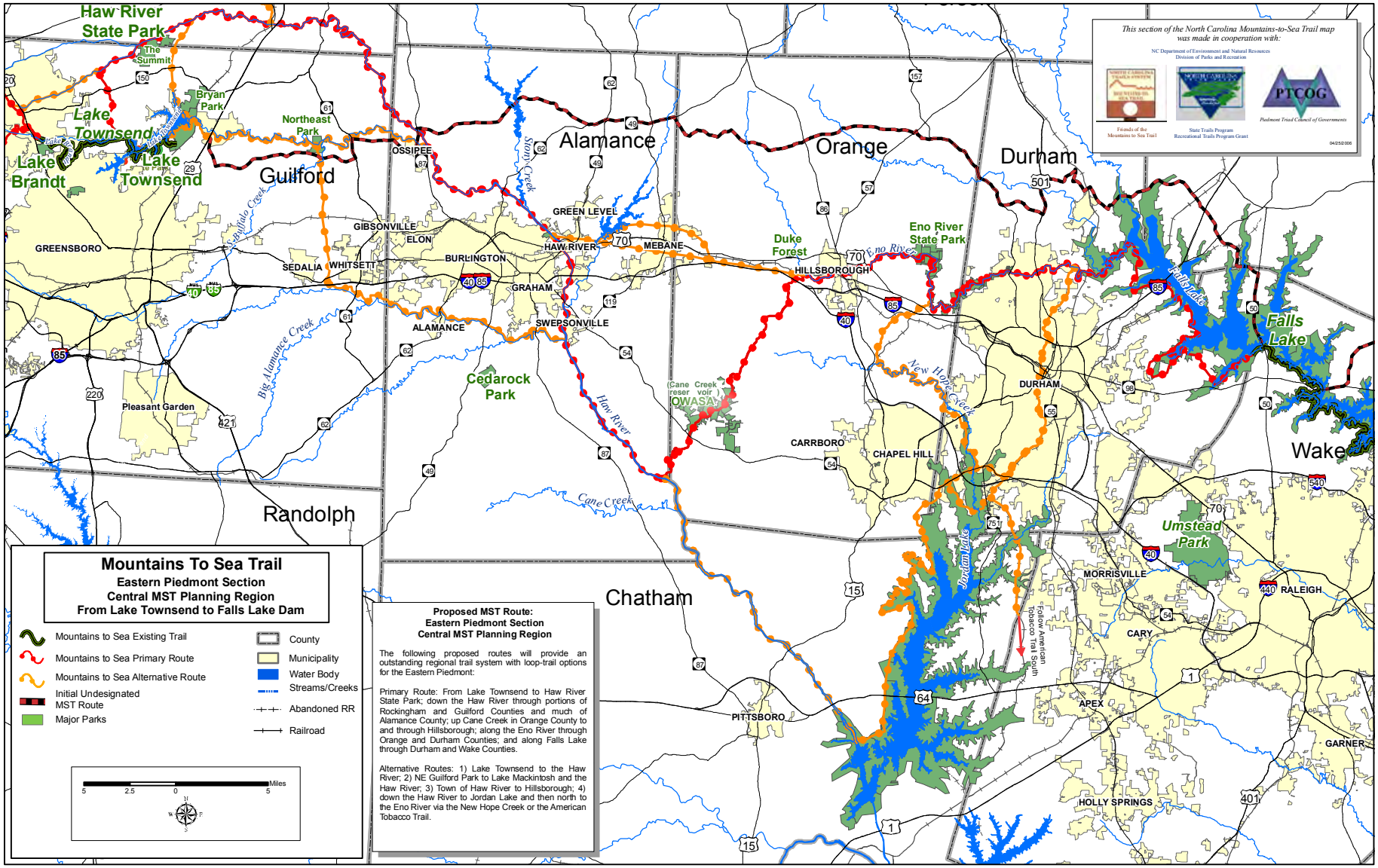


figure 4: north Carolina's Mountains-to sea t rail, e astern Piedmont s ection

In October 2006, the *Greensboro Urban Area Bicycle, Pedestrian and Greenway Master Plan: Summary of Key Findings* was published. All of northern Guilford County was included in this planning effort that established several long term plans for greenways linking to Haw River State Park. One of these greenways will follow Mears Fork Creek; the Haw River Trail will follow the Haw River from one end of the county to the other (with a portion through Rockingham County); and others will extend north to the park from Lake Townsend and Bryan Park north of Greensboro.

The city of Reidsville has plans for trails and greenways through the municipality as well as an extension out to Lake Reidsville Park on the north side of the reservoir.

regional land use

Current land uses in and around the park are primarily agricultural, forest, and residential development. Predominant zoning in and around the park in both Guilford and Rockingham counties allows for agricultural and residential uses. Based on current zoning, land uses around the park will not likely change to other non-residential or non-agricultural uses if developed. The residential zoning has resulted in and may continue to result in residential development threats to valuable natural resources. The 2007/2008 aerial photograph in Figure 9 (later in this document) provides a snapshot of current use patterns in and around the park.

r eCrea tional r esour Ces and v isit ation

The intent of the N.C. Division of Parks and Recreation is to manage Haw River State Park as one park with two components, these being: 1) the greater park, to serve traditional park uses, educational programs, and connection to state and regional trails including the Mountains-to-Sea Trail and 2) The Summit Environmental Education Center (The Summit), to continue as a center for environmental education, conference center, and training facility within the greater area of the park.

Current use of the park is limited to the campus of The Summit. Additional recreational opportunities to be made available within the greater park area include camping, interpretive trails, hiking, viewing/photographing nature and picnicking.

Programs and v isitation s ummary for t he s ummit e nvironmental e ducation Center

The Summit was the first residential environmental education program owned and managed by the N.C. Division of Parks and Recreation. In 2008, The Summit drew 93 different school groups participating in 2,461 programs. Group programs at The Summit range from half day programs to five day and four night programs

Beyond its primary role as an environmental education center, The Summit serves as a training facility for the state parks system and a conference center for groups of 10 or larger. It also provides a serene and natural setting for successful employee training programs, family reunions, youth retreats, team building conferences, spiritual retreats, marriage retreats, holiday parties and club events. Its client list includes businesses, government agencies, conservation organizations, college and university groups, mental health organizations, hobby groups and churches, to name just a few.

Environmental Education Program

The Summit is a true outdoor environmental learning center that specializes in overnight field trips for groups of all ages. All courses and activities are designed to meet or exceed state and national standards for curriculum. The courses are described as flexible and can be tailored to meet specific needs of teacher

Mission Statement

The Summit Environmental Education program is committed to immersing students in an engaging, informative, entertaining and inspiring curriculum that nurtures a lifelong respect for the relationships within our natural environment.

e nvironmental e ducation in the w etlands

Canoeing on r obins n est l ake

The Summit's environmental education staff provides a variety of courses and innovative activities for youth and adult groups. These wide-ranging courses, as well as team-building sessions, build on a respect for nature.

The environmental education program makes use of multiple indoor classrooms for lab exercises and presentations as well as two outdoor amphitheaters, hiking trails, a six-acre lake and a boardwalk that meanders through wetlands. All of this supports the program's commitment to immersing students in an engaging, informative, entertaining and inspiring curriculum.

Conference Center Amenities

The Summit offers complete conference center amenities for lodging, meeting, recreational, and special programming for overnight groups ranging from 10 to 180 in size and day use groups ranging from 10 to 200 in size. Conference visitor attendance ranged from 7,224 to 8,409 per year from 2006 to 2009. The Summit includes eight indoor meeting spaces, motel and dormitory-style lodging, and recreation facilities including a six-acre lake and multiple walking trails.

Due to the setting and recreational opportunities, all conferees receive the opportunity to connect with nature during their stay at The Summit. This can be reinforced through the addition of environmental interpretive exhibits in the park.

Visitation

The N.C. Division of Parks and Recreation took possession of The Summit in 2005. The facility transitioned to full operation by the state in 2007.

Total visitor days per year for 2007 through 2009 has exceeded 20,000. Park visitation records show that over the last two years, visitors have been attending more multi-day events than single day events.

Over the last several years, the park has been undergoing kitchen and cottage renovations. Additionally, in 2009, clients attributed cancellations of previously scheduled conferences and education programs to budgetary impacts of the economic downturn. Both of these causes have resulted in some drop in attendance, so no definitive trends in visitation since the N.C. Division of Parks and Recreation assumed full operation of The Summit could be determined.

Recreational Opportunities

Current recreational opportunities for all rental guests include bird watching, freshwater fishing, hiking numerous trails and the wetlands boardwalk, nature photography, nature study / environmental education, viewing the diverse scenery of the park, visiting natural areas, and canoeing on Robins Nest Lake.

interpretation

The 1987 State Park System Act establishes that: Park lands are to be used by the people of the State and their visitors in order to promote understanding of and pride in the natural heritage of this state.

Park interpretation and environmental education are primary ways in which the N.C. Division of Parks and Recreation achieves this purpose.

Interpretive themes are summary statements about the ideas, concepts, and stories that are central to the nature and significance of the park. Primary themes provide the foundation from which programs and media are developed. Most major interpretive efforts should relate to one or more of the primary themes. Effective interpretation results when visitors are able to connect these concepts with the park's resources to create personal meaning from their experiences.

The two primary interpretive themes for Haw River State Park are:

1. *Connecting with Nature*

In our fast-paced modern society, it is not always easy to find time to simply enjoy nature. Research demonstrates that spending

quality time in natural outdoor settings promotes learning, increases creativity and encourages healthier lifestyles*. The Summit Environmental Education Center offers experiential outdoor education curriculum for schools and youth groups. Goals of the program include helping students feel more comfortable outdoors and helping them develop important skills while teaching them about their natural world (e.g., observation skills, map reading, communication). A self-guided interpretive trail in the greater park area will encourage visitors to participate in similar nature observation and appreciation activities.

2. *The Value of Wetlands along the Headwaters of the Haw River*

Wetlands are important areas where land-based ecosystems transition into a water-based ecosystem. Haw River State Park offers a great opportunity to observe wetlands along the flood plain of the Haw River. The many benefits of these wetlands include maintaining water quality, providing wildlife habitat and lessening the effect of floods and droughts. Wetlands serve as natural filters, keeping excess sediment and other pollution out of streams and rivers. Wetland boardwalks give visitors a firsthand look at the unique wetland hydrology, soils, plants and wildlife.

Other secondary interpretive themes have been identified to complement the primary interpretive themes. They are:

- Astronomy (including the use of outdoor lighting that minimizes light pollution)
- Cultural history
- "Green practices" and sustainable living
- Wildlife and plants of Piedmont forests

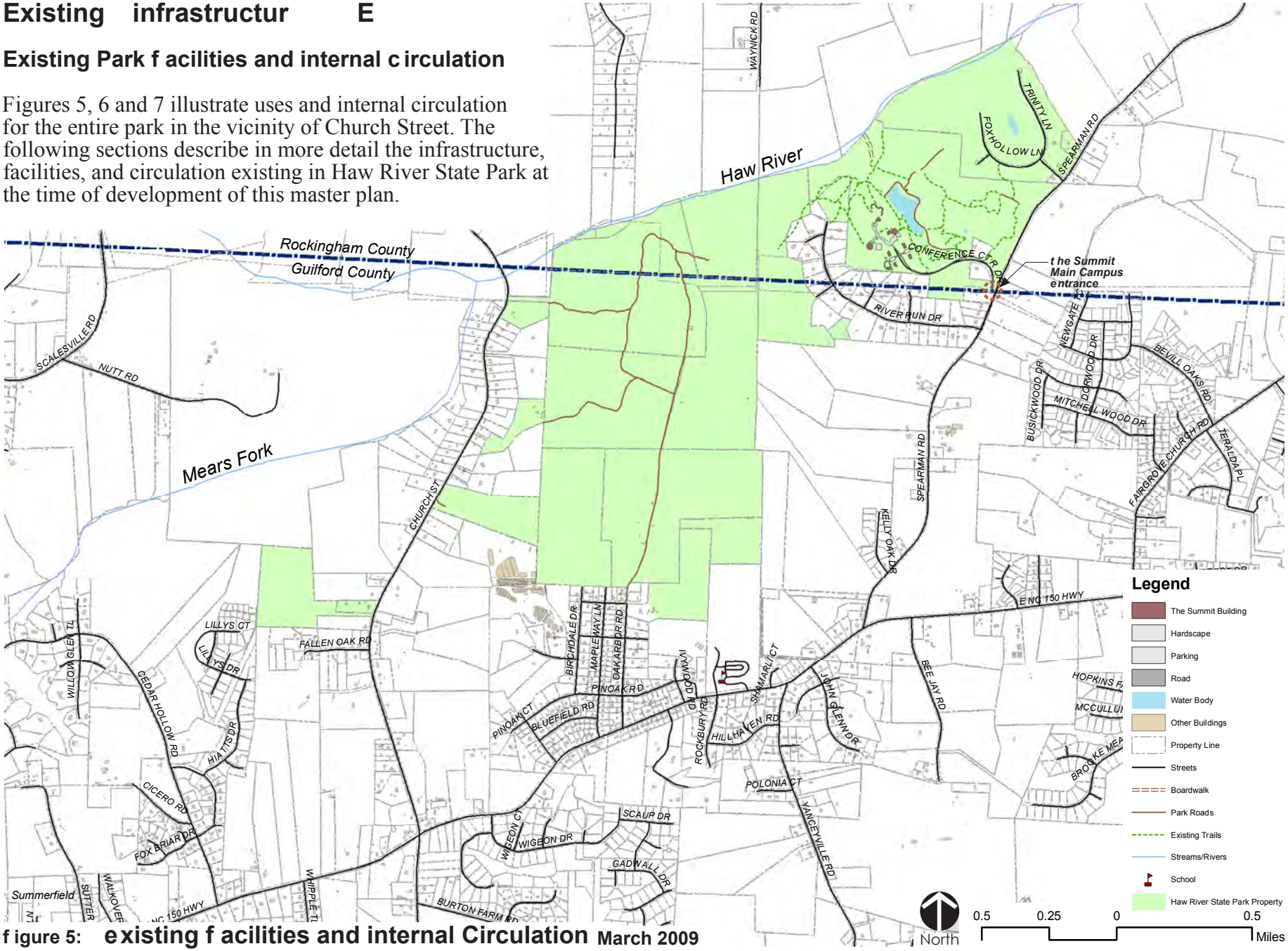
environmental education experience

* Online summary of research-based studies concerning the benefits of nature experiences is available through the Children & Nature Network at *http://www.childrenandnature.org/research/*.

Existing infrastructur E

Existing Park f acilities and internal c irculation

Figures 5, 6 and 7 illustrate uses and internal circulation for the entire park in the vicinity of Church Street. The following sections describe in more detail the infrastructure, facilities, and circulation existing in Haw River State Park at the time of development of this master plan.



f igure 5: e xisting f acilities and internal Circulation March 2009

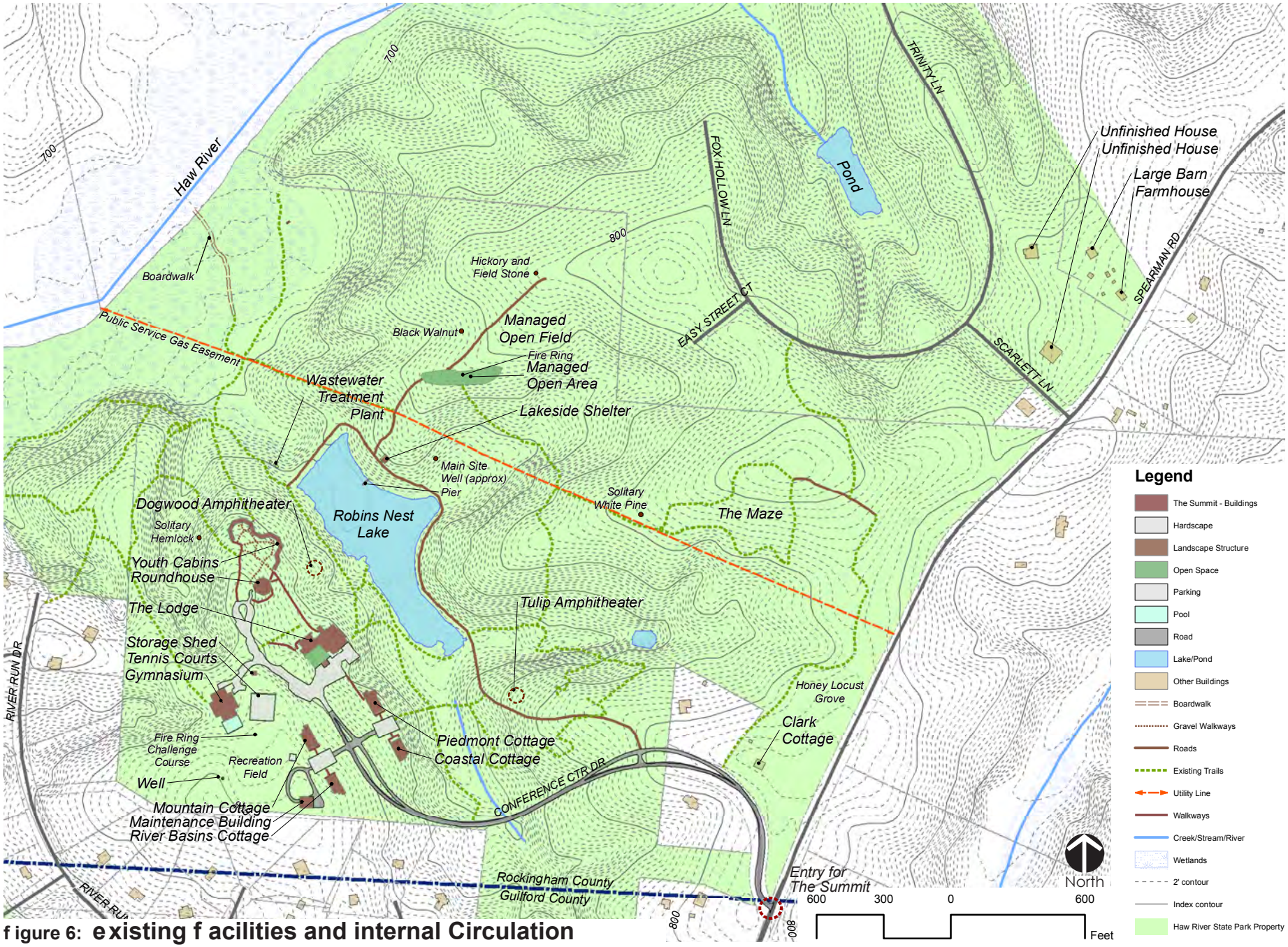


figure 6: existing facilities and internal Circulation detail - the summit environmental education Center

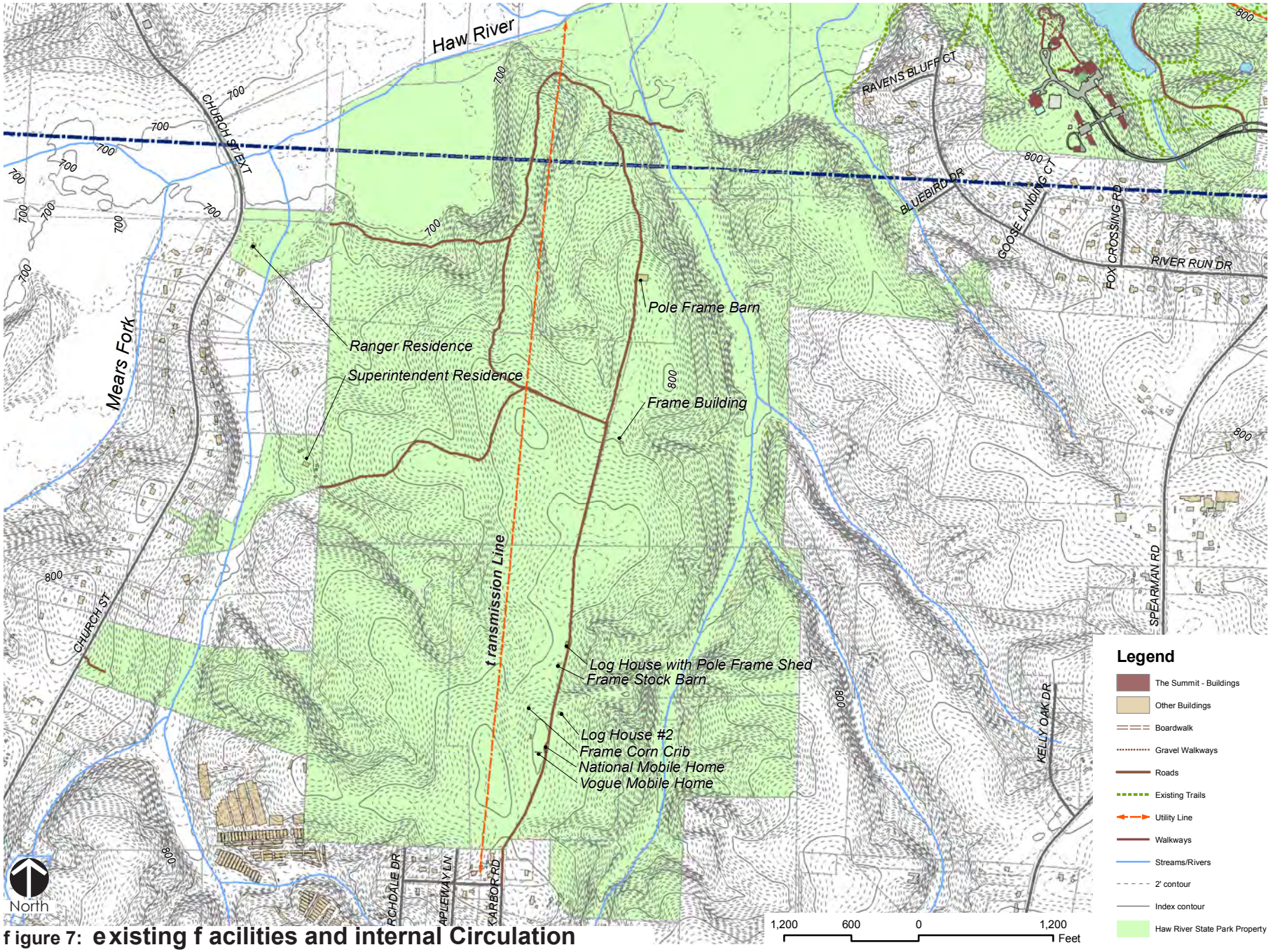


figure 7: existing facilities and internal Circulation detail - Church street section

buildings and structures inventory

Information for the building and structures inventory is based on a summary provided by park staff in February 2009 as well as information contained in appraisal reports prepared for properties during park acquisition (Aufrance, 2007 and McNairy & Associates (a-c), 2007) and a Facilities Condition Assessment Program report (Murray, 2004) unless otherwise noted.

The buildings are listed with the date of construction (when available), approximate square footage and description. No building inventory numbers had yet been designated for this park. Most of The Summit's infrastructure already was in existence when the state acquired the park land in 2005. Some renovations to structures have taken place since acquisition, as noted in the inventory below.

Existing Significant Buildings and Structure

(The Summit)

The Lodge (1981, most recently renovated 2000). 9,096 square feet. One-level, heated, wood-framed, slab-on-grade structure used as meeting space, offices for sta f, kitchen, and dining.

Roundhouse (1989, renovation in progress 2009). 7,500 square feet. Two-level, heated, wood-framed structure with masonry accents, with slab-on-grade foundation. Used for meeting space and offices for the director and assistant director of Environmental Education.

Maintenance Building (2002). 3,600 square feet. One-level, unheated, metal building used for maintenance, storage, and as a workshop. Concrete floo .

Cottage #100 - Piedmont Cottage
(1981, renovated 2008). 3,034 square feet. One-level, 'motel-type,' heated, wood-framed structure, on a concrete slab. Primarily used for lodging. Consists of 12 bedrooms with adjoining bathrooms, a conference room, a utility room, a laundry room, and two guest rest rooms.

Cottage #200 - Coastal Cottage
(1981, renovated 2007). 3,517 square feet. One-level, 'motel-type,' heated, wood-framed structure, on a concrete slab. Consists of 12 bedrooms with adjoining bathrooms, a conference room, and a housekeeping closet.

Cottage #300 - Mountain Cottage
(1981, renovated 2008). 3,750 square feet. One-level, 'motel-type,' heated, wood-framed structure, on a concrete slab. Consists of 12 bedrooms with adjoining bathrooms, a conference room, and a housekeeping closet.

Cottage #400 - River Basins Cottage
(1981, renovation in progress 2009). 3,641 square feet. One-level, 'motel-type,' heated, wood-framed structure, on a concrete slab. Consists of 11 bedrooms with adjoining bathrooms, a conference room, a kitchenette, and a housekeeping closet.

Storage Shed
Wood-frame structure used to store tools. Located near gymnasium.

Gymnasium (1989). 8,000 square feet. One-level, steel-framed and concrete block, slab-on-grade structure used for indoor recreation, two classrooms, and two office spaces. Structure includes outdoor swimming pool in fair condition.

Youth Cabins (1989). 5,000 square feet. One-level, unheated, wood-framed structure with masonry accents suspended on an elevated structural steel framework. Used as student dormitories. Ten separate sleeping quarters each with an adjoining rest room. Eight bunk beds in each sleeping quarter (and one roll away). Asphalt shingle roof. Vinyl and ceramic tile flooring

Clark Cottage - Ranger Residence (1992). 1,600 square feet. Two-level, heated wood-frame structure to be used as a ranger residence. Composition shingle roof. Wood siding. Carpet, wood and tile flooring.

Wastewater Treatment Plant Structure (1980). 254 square feet. Unheated wood-frame structure and metal structure, both on concrete slabs used to house pumps and equipment for wastewater equipment.

Shed
Unheated, wood-frame structure located near The Lodge.

Lakeside Shelter.
770 square feet. Unheated, one-level wood-framed, screened-in structure used as a picnic shelter with two rest rooms. Located on the eastern side of Robins Nest Lake. Concrete floor and asphalt shingle roof.

Well House #1
Unheated wood-framed structure used to house well and pumps.

Well House #2
Unheated wood-framed structure used to house well and pumps.

Dogwood Amphitheater
Wood-frame seating for 90 people and stage.

Tulip Amphitheater
Wood-frame seating for 90 people and fire ring.

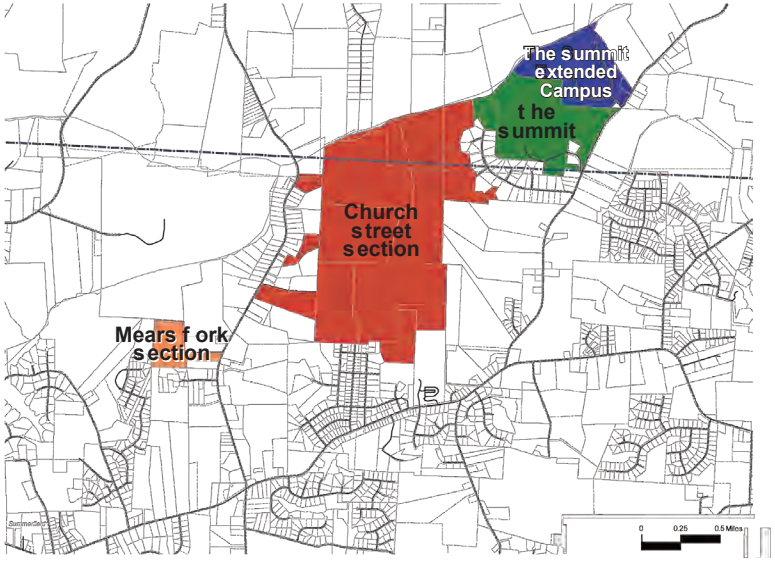


figure 8: Primary Park sections

Existing Significant Buildings and Structure

(The Summit Extended Campus)

For descriptive purposes, the following descriptions refer to specific areas of the park as named sections. These sections are defined in Figure 8

Farmhouse - Seasonal Housing (renovated 2002,2003). 1500 square feet. One-level, heated, wood-framed structure with storage loft. Two bedrooms, two baths.

Large Barn. 2,640 square feet. Two-level, wood-framed structure located behind Farmhouse.

Small Storage Building. 770 square feet. Small wood-framed structure located near Farmhouse.

Small Storage Building. 450 square feet. Small wood-framed structure located near Farmhouse.

Small Storage Building. Small wood-framed structure located near Farmhouse.

Well Structure. Small wood-framed structure housing well serving Farmhouse.

Unfinished Structu e - 121 Scarlett Lane (2004 - incomplete). 2,432 square feet. One-level, incomplete, brick structure with crawl space. Four bedrooms, 2.5 baths.

Unfinished Structu e - 133 Trinity Lane (2004 - incomplete). 1,957 square feet. One-level, incomplete, brick structure with crawl space. Three bedrooms, two baths.

existing buildings and structures

(at Church Street Section)

Ranger Residence
6124 North Church Street
1,600 square feet. One-level, modular structure. Three bedrooms, two baths.

Superintendent Residence
6090 North Church Street (2000)
1,500 square feet. Two-level (upper level unfinished), modula structure. Three bedrooms, two baths.

Information for the following buildings and structures is based on a summary provided by the former owner of the property, Thaxton Richardson. He noted that he has estimated the ages of older buildings due to no specific evidence other than their existence on the site when he first saw the property in 1939

Vogue Mobile Home (1971 year model). 720 square feet. Installed on site in 1972. Utility connections include water, septic, electric, telephone, fuel oil.

National Mobile Home (year and model unknown). 720 square feet. Installed on site 1999 for storage only. No utility connections.

Pole Frame Barn (1958). 4,680 square feet. 24 bay structure with metal roof and siding on three sides (south side open). Natural floo . Metal covered sliding doors (12'x12') on east and west sides. Wired for 110 volt and 12 volt lights using generator or battery.

Frame Building (ca. 1920s). 300 square feet. Metal roof and siding. Wood floo . Used for storage.

Log House with Pole Frame Shed (ca. late 1700s to early 1800s). 352 square feet. German log construction (notched corners and wood pegs), metal roof, wood floo , partial asphalt siding. Wired for and connected to 220 and 110 volt electric power grid. Pole frame shed (constructed 1958, 627 square feet) with metal siding on two sides attached.

Frame Stock Barn (ca. late 1800s, early 1900s). 454 square feet. Frame construction, metal roof, oak board siding, natural floo . One wood sliding door and one walk-in door. Attached shed with metal roof and siding, natural floo , and wood sliding door. Wired for and connected to 110 volt lighting.

Log House #2 (ca. late 1800s). 325 square feet. Exposed log walls, metal roof, and wood floo . One room addition (1940, 192 square feet) of frame construction, metal roof, wood siding and floo . Wired for and connected to 110 and 220 volt power.

Frame Corn Crib (ca. early 1900s). 93 square feet. Wood frame, metal roof, slatted wood siding, wood floor with attached open shed of 96 square feet. Relocated to current location in 1985. Last used as chicken house in 1985.

r oads and u tility inventory

Information for the roads and utility inventory was developed from data mapped by the N.C. Division of Parks and Recreation using mapping grade Global Positioning System technology as well as on site observation and analysis.

Maps of existing utilities, as developed by site maintenance staff, are included as Appendix C.

e xisting r oads and t rails

Conference Center Drive consists of approximately seven-tenths of a mile of paved road. The Summit Extended Campus also contains approximately seven-tenths of a mile of paved road. Over two and nine-tenths miles of unpaved roads and about five miles of natural surface trails exist in the park. Most of these roads and trails were in existence prior to acquisition of the property by the N.C. Division of Parks and Recreation. The park staff maintains these roads and trails using park equipment.

Conference Center Drive, the main entrance road into The Summit, is an approximately 18 feet wide asphalt paved road, with varying shoulder widths. Fox Hollow Lane, Easy Street Court, Scarlett

Conference Center d rive

Lane, and Trinity Lane are asphalt paved roads installed for a former development previously planned for The Summit Extended Campus.

Vehicular Circulation at The Summit

Conference Center Drive forms the main spine for accessing the The Summit Main Campus. It is a winding drive that provides a calming experience as it transitions from an exposed and open agricultural area on Spearman Road to the forested canopy of the park. The road traverses two ridges and crosses a small drainage way. The entry into the park conveys the sense of a traditional ‘parkway,’ with the drive periodically split into divided medians and narrower one-way lanes. The hierarchy of the park’s internal circulation stems from this main drive to secondary access drives leading to each of the buildings on the campus and their adjacent parking areas.

t ractor trailer accessing kitchen loading dock

Service and delivery vehicles currently access The Summit at the loading dock at the kitchen in the lodge as well as the maintenance building. Vehicles typically deliver food and supplies to the kitchen and supplies to support the residential aspect of the park and the remainder of the site and facilities. Trucks varying in size from panel trucks to tractor-trailer trucks access The Summit site.

Additionally, solid waste haulers pick up waste and recyclables from the parking area adjacent to the lodge. The Summit also accommodates bus traffic during la ge group events. Dedicated bus parking on the grounds of The Summit is needed.

b us arrival at the r oundhouse

Pedestrian Circulation at The Summit

The network of pedestrian circulation at The Summit is composed of a series of informal paths and paved walks that form the framework of the campus. The pathways seem to have developed over time in response to the function of linking and/or connecting the various facilities and different activity areas. Three primary material types have been used for the pedestrian walks including concrete, asphalt, gravel and soil/mulch (natural). Wood decking is the dominant material used to span ditches, gullies, and other drainage features.

A campus-wide pedestrian circulation design is needed that places importance on pedestrian experiences and improves the overall sense of a campus setting. Further recommendations are provided in the Master Plan section of this document.

e xisting Parking a reas

The conference center has a total of 118 paved parking spaces for use by the public. This includes seven accessible parking spaces. Twenty-four of these spaces (including one accessible space) are closely related to the roundhouse, 13 are closely related to the gymnasium, 39 (including two accessible) are closely associated with the lodge, and the remainder are associated in near equal numbers with the four cottages. On busy days, The Summit parking lot is full.

Parking near the r oundhouse

existing water systems

The water systems that serve the park each are supplied by potable wells with submersible pumps.

The Summit Water System
This system is served by a well constructed in 1980. It is also served by a backup well that was built in 1989. These wells provide The Summit with up to 82,600 gallons of water per month.

6124 North Church Street Water System
This system is served by a 200 feet deep well with a flow rate of 20 gallons per minute installed in 2006.

6090 North Church Street Water System
This system is served by an 80 feet deep well with a flow rate of six gallons per minute installed in 1999.

Clark Cottage Water System
This system is served by a well of unknown age and depth.

Farmhouse Water System
This system is served by a well of unknown age and depth.

Church Street Section Water System
Several well systems serve this portion of the park property. The following descriptions were provided by the former owner of the property.

The primary water system is a drilled well, 145 feet deep with a half horsepower, 12 gallons per minute, 220-volt Franklin submersible pump on one inch polyethylene 160 psi pipe connected to a 40 gallon air bladder pressure tank (pressure switch set for 40-60 psi). The system has a six and one-quarter inches in diameter galvanized casing set to approximately 90 feet at bedrock. The pressure tank was installed circa 2000. The pump, pump pipe, and pressure switch were installed in November 2008. The pump is approximately five feet from the bottom of the well. Power is supplied to the pump via an underground 10 gauge copper UF 2 wire cable from the Vogue Mobile Home. This well is plumbed using polyethylene pipe of varying sizes to the Vogue Mobile Home, a faucet on the front of Log House #2, a yard hydrant near this same structure, and a yard hydrant in the parking lot adjacent to the mobile homes.

A second well on site is a bored well with 20-inch concrete tile. This well is 60 feet deep and ends at bedrock. It is located near the south of Log House #2. It is reportedly undependable water flo , with a volume too low to pump and has never been successfully used by the prior property owner.

The third well is a drilled well with a two-inch galvanized casing located on the porch attached to the steel building on site. It is estimated that this well was drilled in the late 1920s, and it is served by a deep well hand pump mounted on the well casing.

existing sewer systems

The Summit wastewater facilities collect the wastewater throughout the site and convey the wastewater to the site's package waste water treatment plant. The plant uses a bar screen, equalization chamber, activated sludge unit, surge tank, clarifie , sludge holding tank and chlorination facilities. This system is permitted to discharge wastewater under the National Pollutant Discharge Elimination System by permit #NC0046019, effective May 1, 2006 through April 30, 2011. It can handle a maximum volume of 15,000 gallons of wastewater per day.

Descriptions of the other septic systems within Haw River State Park follow.

6124 North Church Street Septic System
This septic system serves two flush toilets and two bath tubs and shower stalls. The system is served by a 1,000 gallon septic tank with a 1,000 gallon pump tank installed by Jones Well and Pump in 1999.

6090 North Church Street Septic System
This septic system serves two flush toilets and one bath tub/shower. This conventional system is served by a 1,000 gallon tank and was installed in 1996.

Clark Cottage Septic System
This septic system serves three flush toilets and two bath tub showers.

Farmhouse Septic System
This septic system serves two flush toilets and two bath tub showers.

Church Street Section Septic Systems
According to the former owner of this property, this septic system was installed in 1972. By his description, it consists of a 1,000 gallon capacity (estimated) septic tank, sized for a four bedroom home, and a drain field of four inch by 12 inch terra cotta pipe in a crushed stone bed. He describes the location of the tank as approximately 100 feet west of the primary site well, and the drain field as running north and south of the tank beginning about 50 feet west of the tank. The system reportedly never has been pumped, overflowed, or presented any other problems since installation

existing electrical system

Duke Energy provides electrical power to all of the park properties. A number of transformers are located at various locations throughout the property. Sixteen different meters exist within the park property not including the ranger or superintendent's residences.

transmission lines on site

Duke Energy electric transmission lines bisects the Church Street Section of the park. The approximate location of this utility is shown in Figure 7.

existing gas / other fuel systems

A contracted propane company provides propane to all park properties excluding the farmhouse on The Summit Extended Campus. The Summit has a total of five freestanding propane tanks. These tanks supply propane for the kitchen in the lodge, the gas logs in meeting rooms in the lodge, and four 100 gallon water heaters in the cottages.

Natural gas is provided to the farmhouse by Piedmont Natural Gas Corporation. The farmhouse has a separate meter. Natural gas also is available adjacent to the roads on The Summit Extended Campus.

A natural gas line with associated easement passes through the park northeast of Robins Nest Lake. The approximate location of this line is shown in Figure 7. A natural gas line with associated easement also passes through the Mears Fork Section.

A gasoline tank and a diesel tank, used by the former farm, are located in the Church Street Section. These are located in the vicinity of the log house with the pole frame shed.

existing telephone system

The State of North Carolina Office of Information and Technology Services department provides telephone service to The Summit. The Summit's lodge has five voice lines, one fax line, six fire alar lines, and 16 phone extensions.

An emergency line located at the pool is provided by AT&T.

The Clark Cottage and both the Ranger and Superintendent's Residences have their own phone lines provided by AT&T.

existing satellite Provider / Cable Provider

Time Warner provides cable service to the park.

Pond and dam inventory

The Summit Main Campus and The Summit Extended Campus have three ponds. All have earthfill dams. A field inspection (dated November 9, 2005 by Schnabel Engineering) of the dam on Robins Nest Lake, a low hazard dam, notes that water is passing through or around the dam other than through the principal spillway system. The report recommends maintenance of the dam including removal of vegetation along the dam to prevent related development of seepage paths through the dam along roots.

A late 2009 inspection of the dam located in The Summit Extended Campus revealed safety concerns. According to this report, breach and restoration would potentially be a less expensive alternative in the long term (and possibly short term) than to repair/reconstruct the dam to minimum dam design standards. No inspection report for the third dam was available as of December 2009. It is recommended that any dams with public access be inspected prior to public use of the facility.

natural features

introduction

Haw River State Park is located within the headwaters of the Haw River. This area is known for its relatively broad floodplains interlaced with an extensive system of wetlands which support the high quality waters. The park property contains several high quality natural communities, a couple of known special status animal species, and extensive wetlands that attract a diversity of bird species.

bluebird

Though average temperature and precipitation are variable across the park due to distinct microclimates created by hydrologic and topographic variability, local recorded averages provide an indication of general trends in the area.

Average temperature and precipitation data for Reidsville, N.C. is the most local data available through the Southeast Regional Climate Center (2009) for 2/1/1962 to 12/31/2007. Average maximum temperatures ranged from 46.9º F in January to 87.0º F in July. Average minimum temperatures ranged from 27.4º F in January to 66.3º F in July. Average total precipitation ranged month to month from 3.10 inches (November) to 4.73 inches (July). The average annual rainfall was 44.69 inches. Average annual snowfall was less than 1 inch.

Generally in North Carolina, prevailing wind is from the southwest for 10 months out of the year and from the northeast during September and October. Wind speed averages 8 to 10 miles per hour (State Climate Office of North Carolina, 2009). Prevailing winds in the park and vicinity may vary from these state averages due to microclimate effects.

Severe weather can occur periodically in Rockingham and Guilford counties. Since 1950, seven tornadoes have been confirmed in Rockingham County, including a strong F3 Tornado (F0 is the weakest, F5 is the strongest) on March 20th, 1998. During the same time period 12 tornadoes have been confirmed in Guilford County, all of F1 or F2 strength (NOAA, 2009).

A weather station has not been installed at Haw River State Park; however, this is a standard feature in most state parks, so it is anticipated one will be installed in the near future and will provide more site specific weather information

Haw River State Park is located in the vicinity of latitude 36° 15’ 00” north, longitude 79° 45’ 24” west. This latitude reflects a solar azimuth elevation angle (essentially the angle of the sun relative to the horizon) of approximately 29.49° at noon on the winter solstice (December 21) and approximately 74.66° at noon on the summer solstice (June 21) (NOAA, 2009). This information is useful for siting buildings and other structures for energy efficiency and solar comfort, both important in designing for sustainability.

Figure 9 represents orthophotography of Haw River State Park flown in 2007/2008 for both Rockingham and Guilford counties as well as the City of Greensboro. This provides a literal snapshot of existing land use in and around the park.

Note: Data utilized for site inventory and analysis was provided by multiple sources and represents the best data available at the time of creation of the maps. Data descriptions, sources, and dates are provided under Resources and References, near the end of this document.

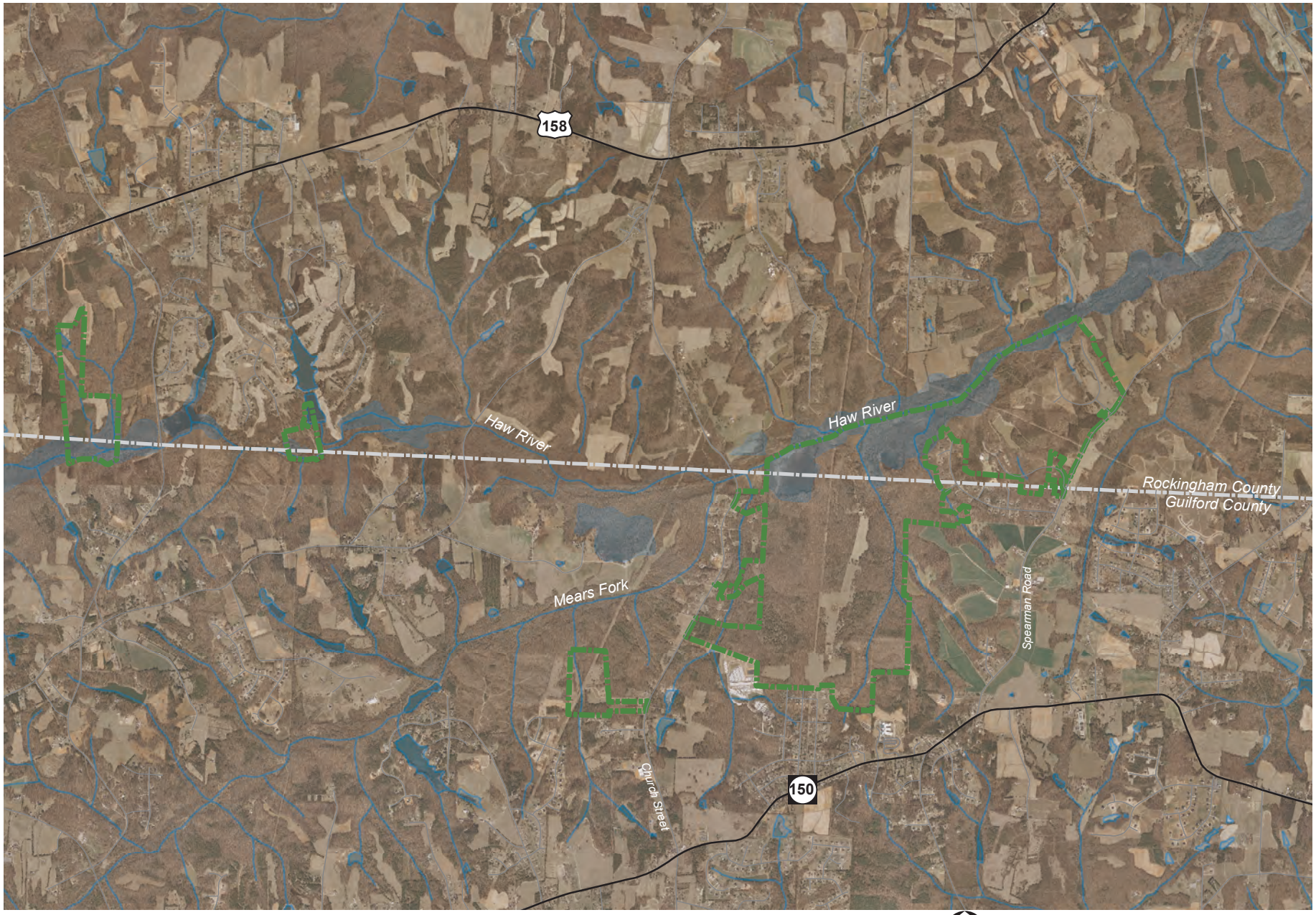


figure 9: Haw river state Park and vicinity aerial documentation
2007 Rockingham County, 2008 Guilford County

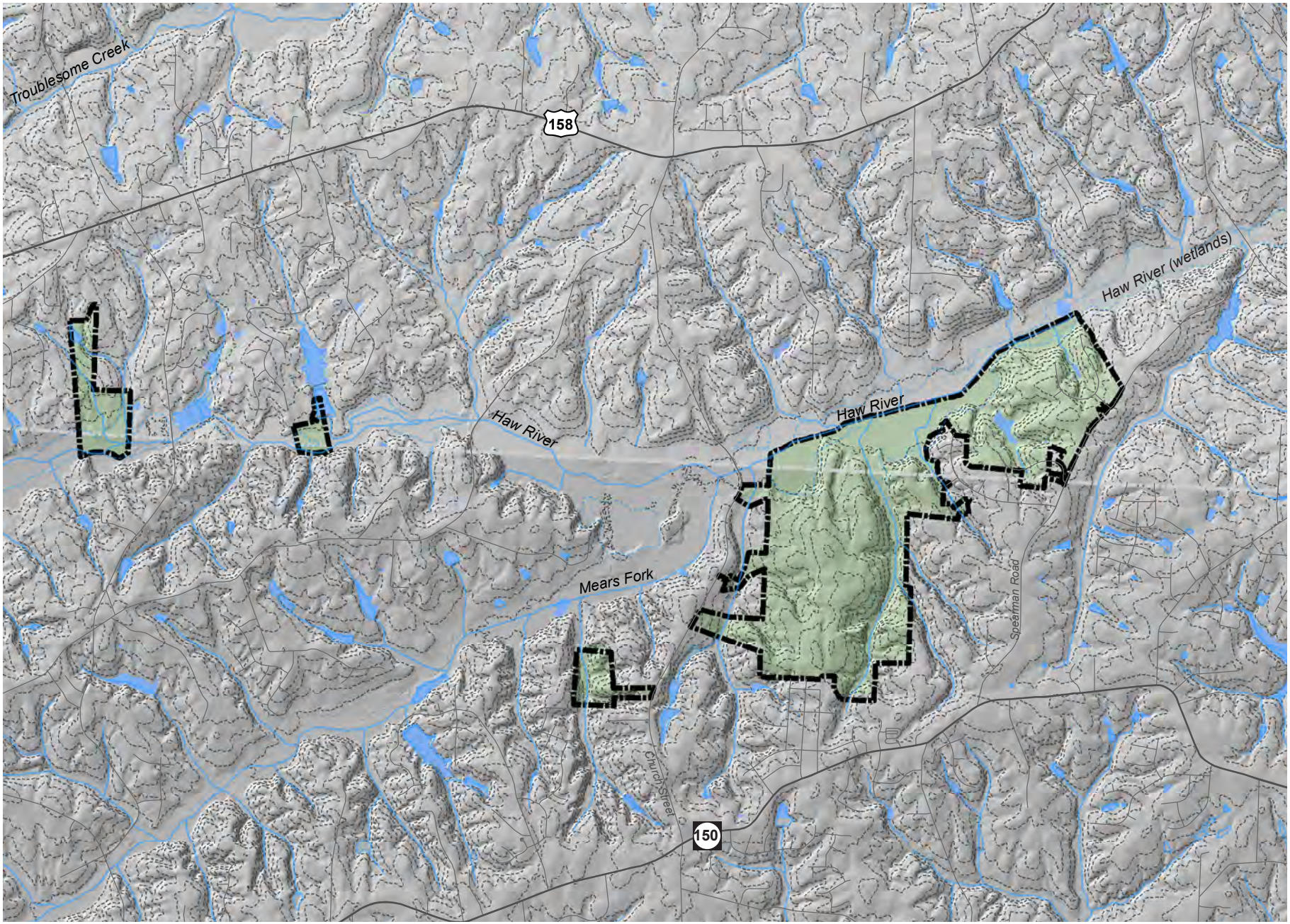
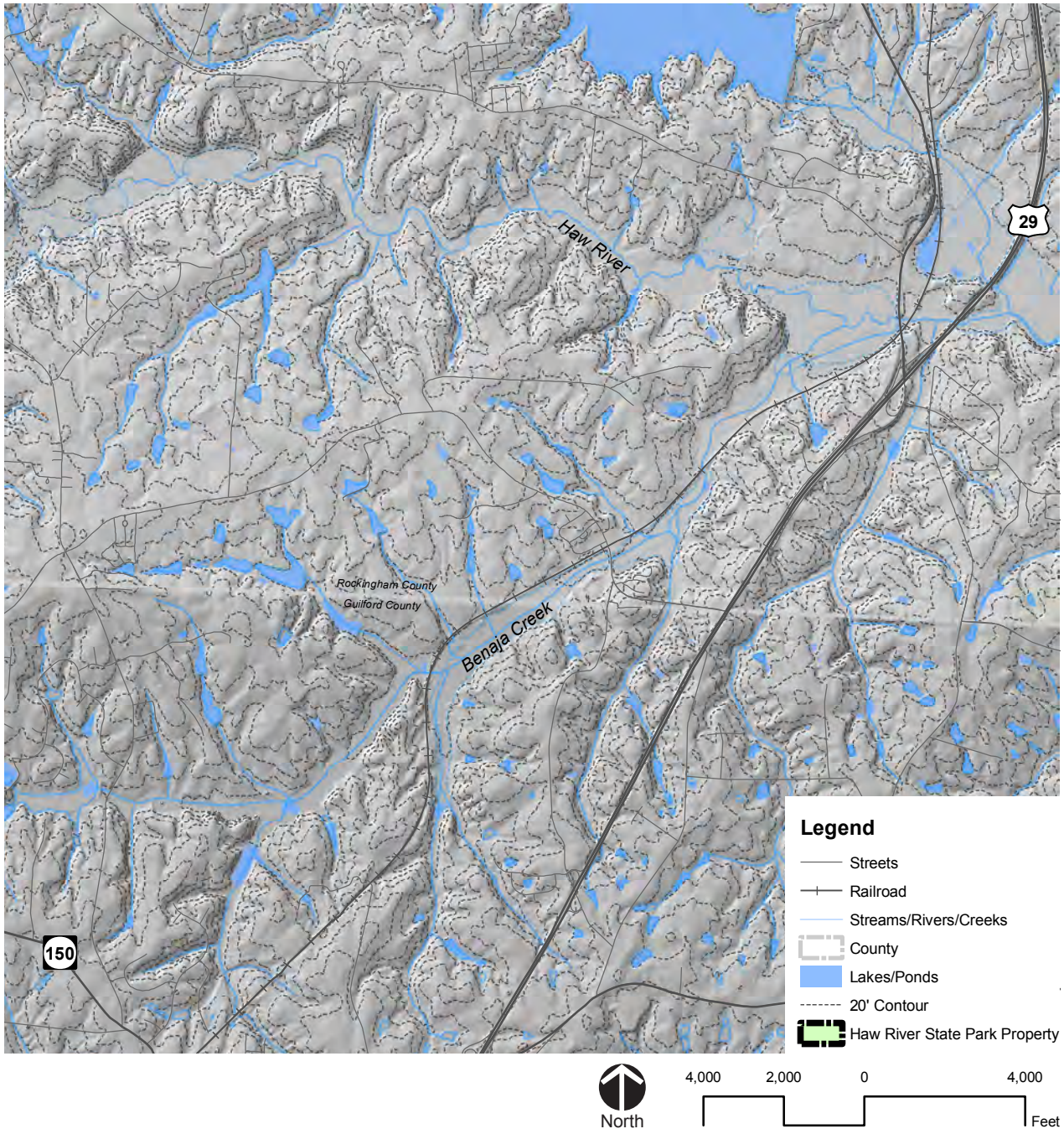


figure 10: **Haw river state Park and vicinity topography**



t opography

Figure 10 illustrates 20-foot topographic contours* for Haw River State Park and surrounding areas. It is apparent that the topography is relatively flat in the vicinity of the Haw River and its associated floodplain and wetlands. The terrain rises to ridges between the Haw River and other nearby tributaries, including Troublesome Creek to the north and Benaja Creek to the southeast. The data used for this project does not indicate a defined channel for the Haw River just to the east of the park property. The river in this area is more defined by he wetlands and floodplains (See Figure 15).

Profile of north slope of Haw Rive

* 2007 contour data. This data does not represent survey quality. Contours created by Light Detection and Ranging (LIDAR).

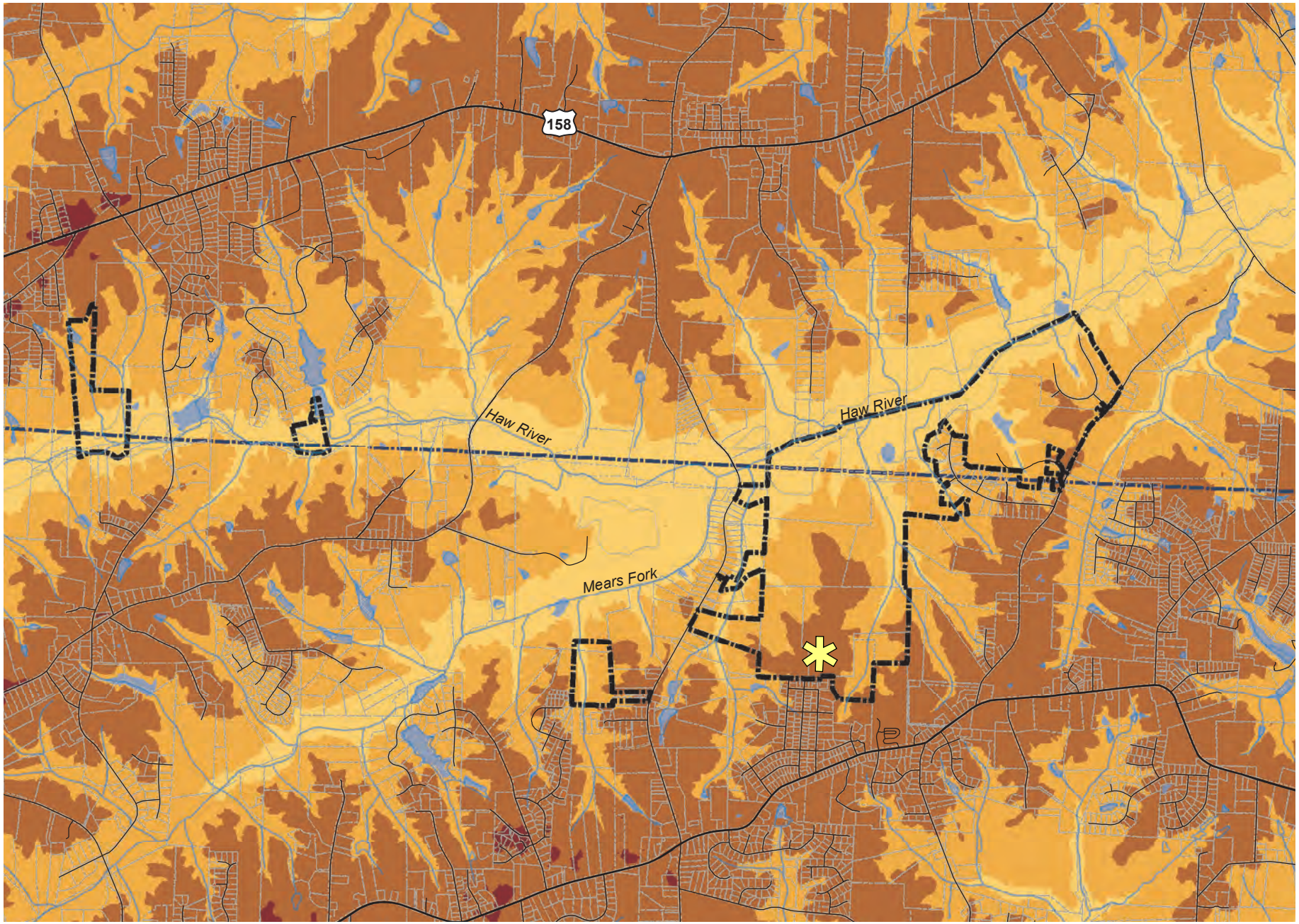
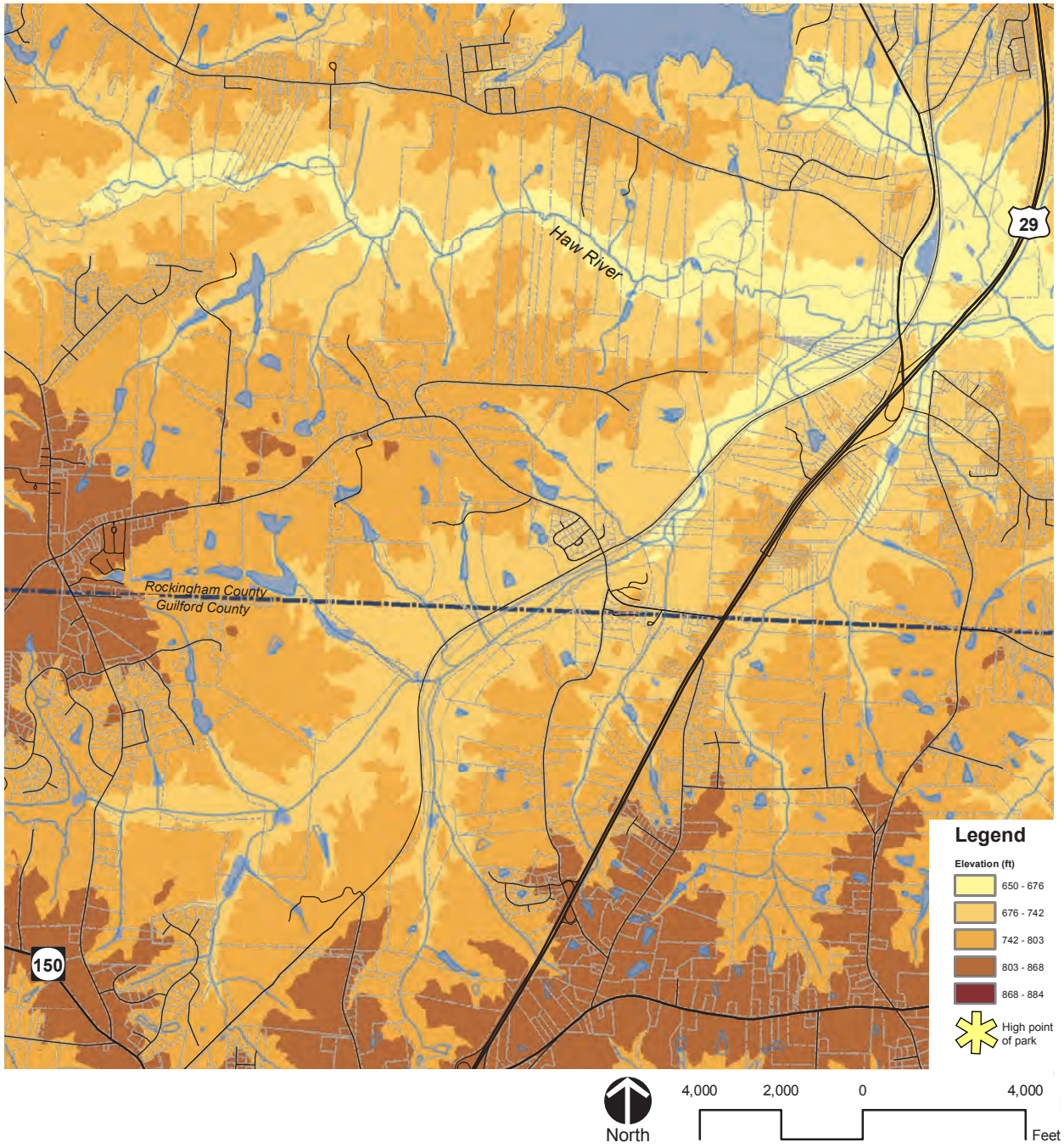


figure 11: **Haw river state Park and vicinity elevations**



elevation

Figure 11 illustrates elevation ranges within Haw River State Park and its vicinity. Elevation is relative to mean sea level.

The elevations within the park itself range from a low of approximately 688 feet in the Haw River stream bed on the northeastern corner of the property to a high of approximately 842 feet. This highest point inside the park property exists just inside the access to the park property at the end of Oak Arbor Road.

The elevation map most distinctly illustrates the ridge and river valley fingerprint of this area with the ridges denoted by dark orange-brown and the lower river and stream valleys in pale yellow.

north slope of Haw r iver

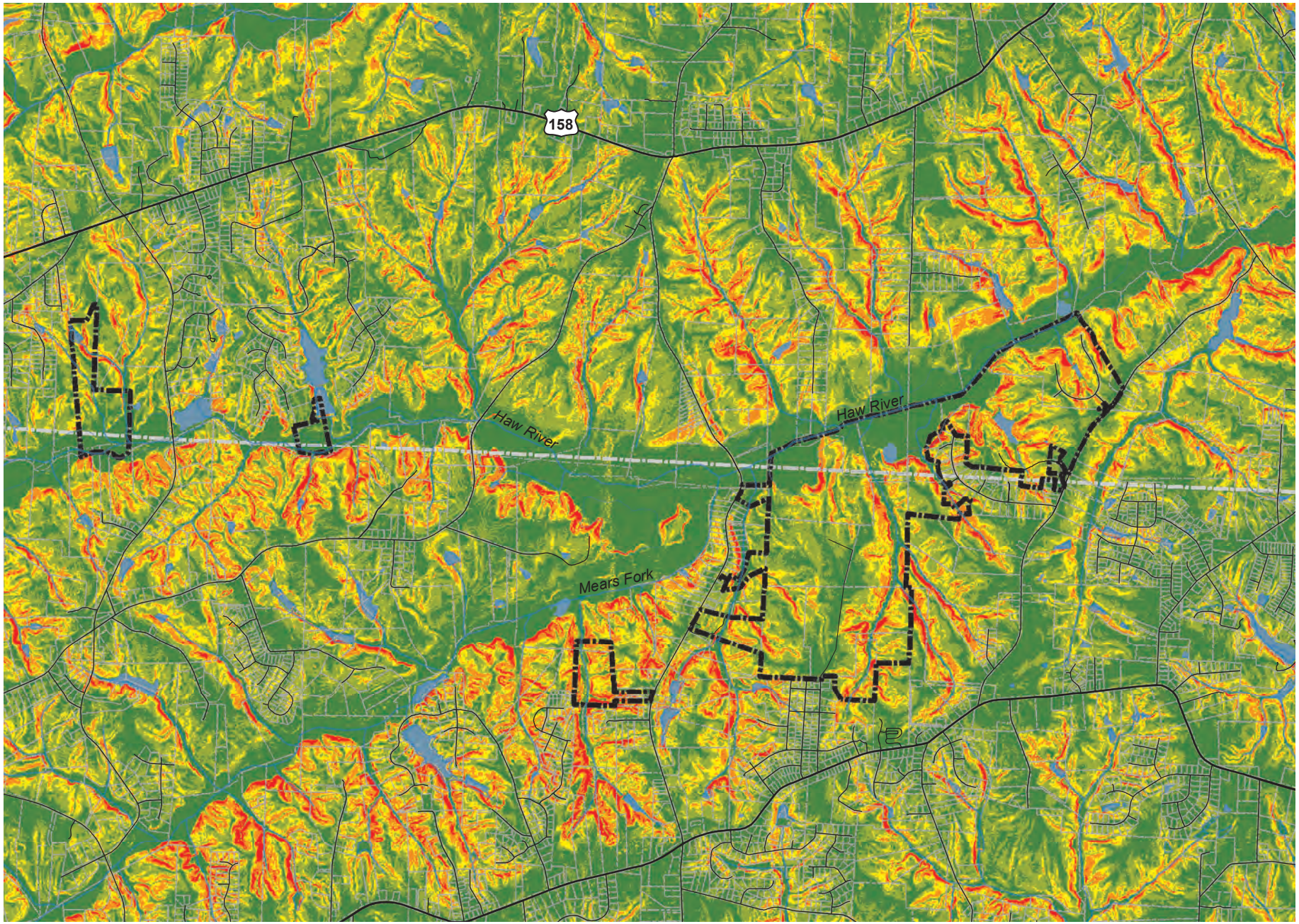
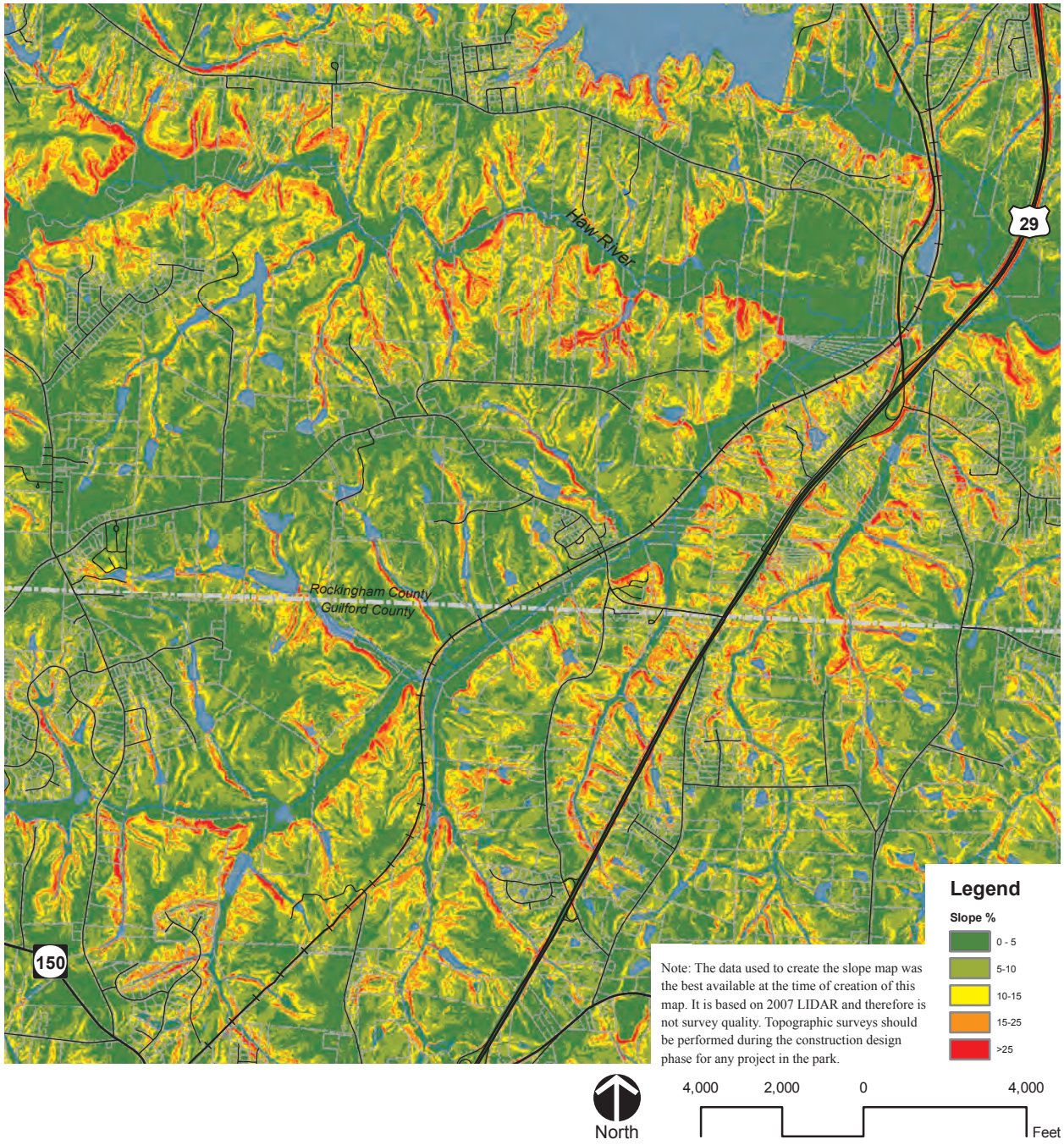


figure 12: **Haw river state Park and vicinity slopes**



slope

The upper Haw River and its vicinity are defined by relatively broad floodplains with some steeper north facing slopes on the south side of the floodplain. Figure 12 illustrates slopes in percent for Haw River State Park.

The floodplains are rather apparent in the dark green areas following the river corridor. The steep north-facing slopes are evident in orange and red, sometimes exceeding 25 percent slopes.

Most of the park land currently is located on the south side of the Haw River. For planning for development of park facilities, it is important to note areas that would be deemed developable based on slopes less than 15 percent and ideally less than 10 percent. This objective should not be difficult to achieve, as is conveyed in the map to the left where the two shades of green represent slopes less than 10 percent.

Based solely on slopes, the most developable areas in the large contiguous portion of the park property are centered along the ridge of the Church Street Section, along a ridge to the east of the Haw River Estates development, in the vicinity of the already developed portions of The Summit, and along the outer edges of the U-shaped road on The Summit Extended Campus. Some smaller ridges with gentle slopes also extend to the west of this U-shaped road.

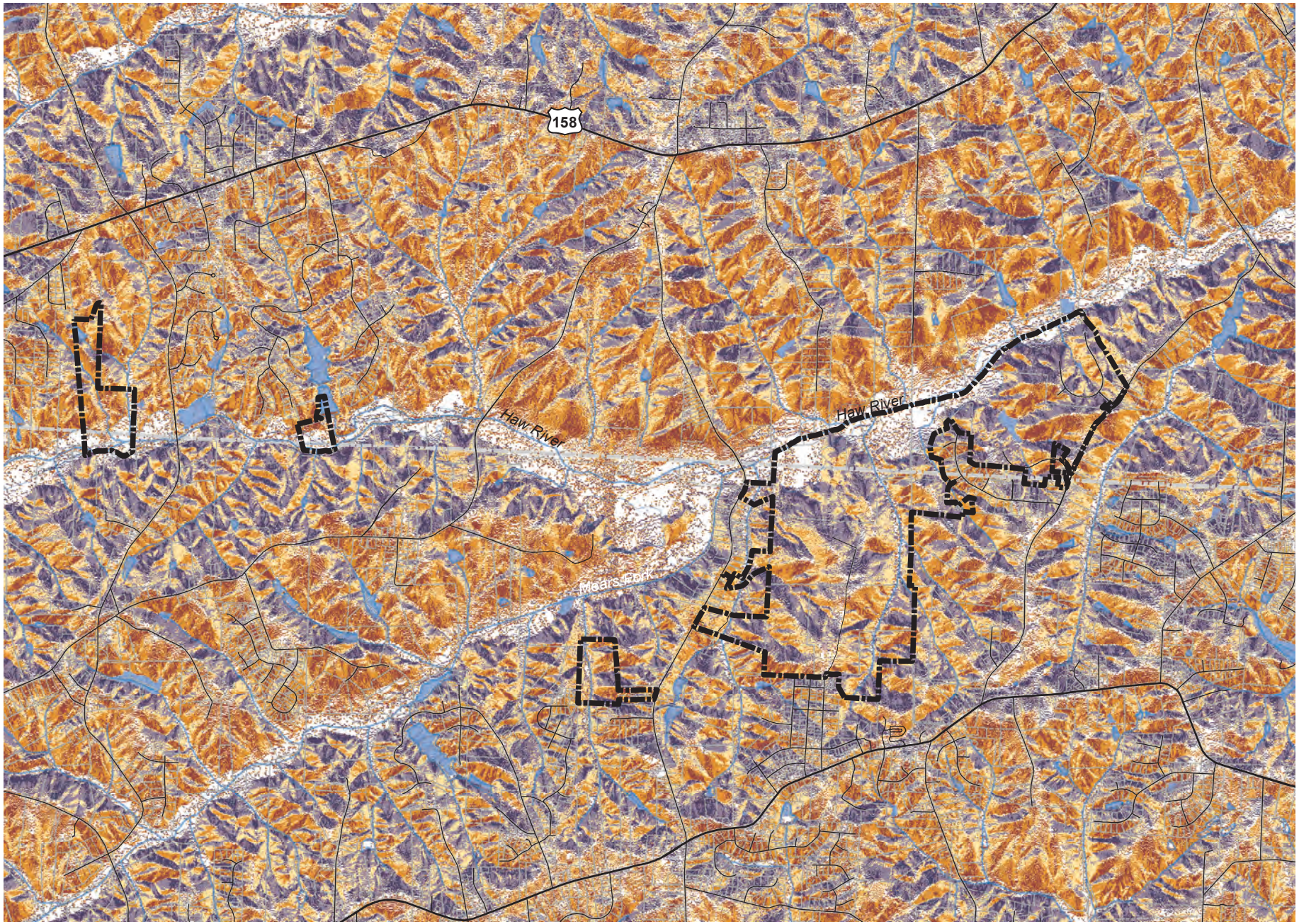
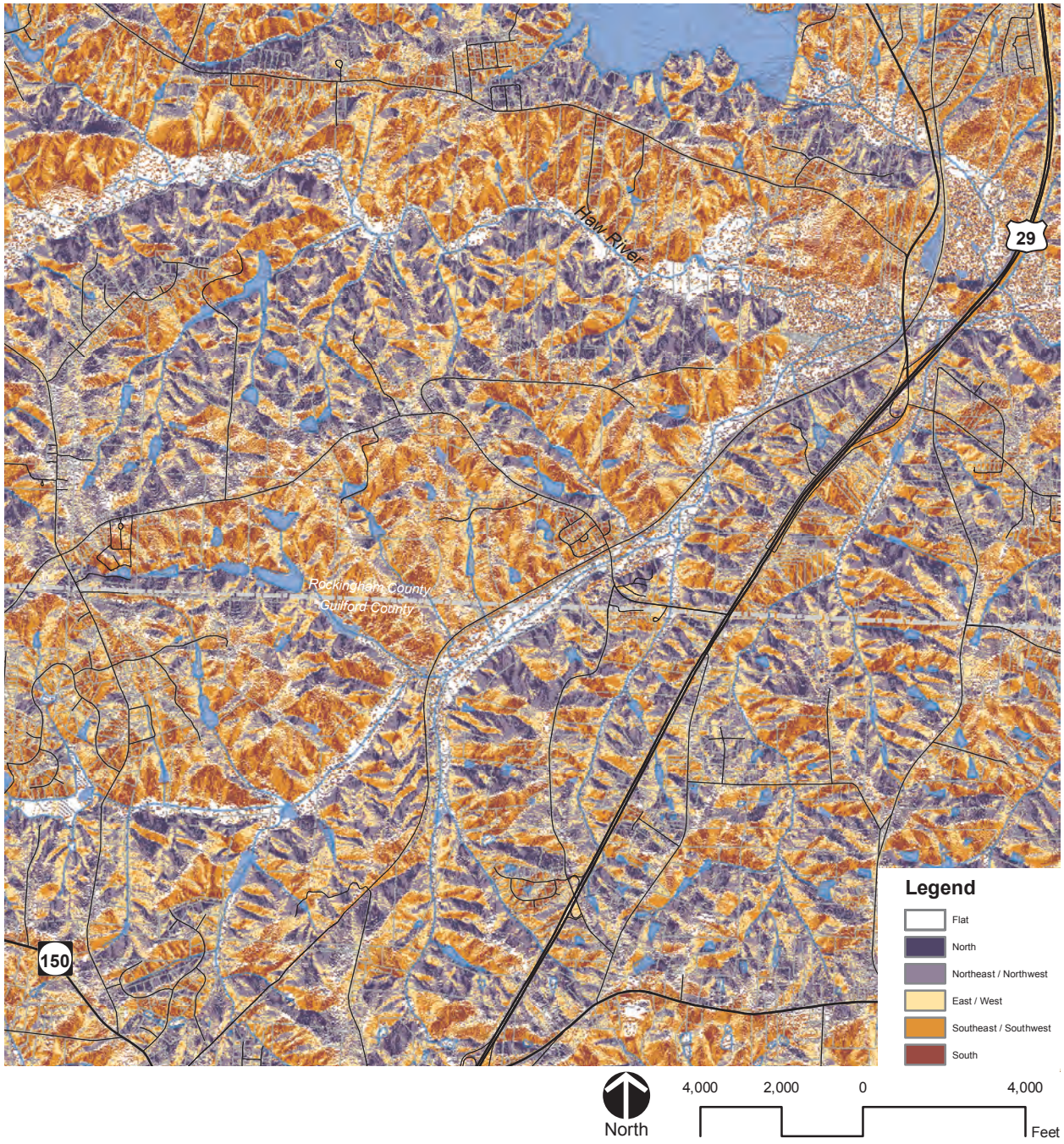


figure 13: **Haw river state Park and vicinity aspect**



a spect

Aspect, or the direction that land faces, impacts vegetative communities that grow upon them, as well as movement of animals based on the vegetative food sources available in these areas. Due to differences in vegetation and microclimate, it also may impact burn rates and heat levels during controlled burn and wildfire events

Figure 13 illustrates aspects in Haw River State Park and its vicinity. Generally, southerly aspects are represented by yellows and oranges, and northerly aspects by blues.

Aspect also is relevant when siting buildings and public use areas. Southerly aspects are ideal for passive solar, energy-efficient building design as well as consideration for comfort in public spaces used in the winter time. Shading through structure or tree canopy should be considered for public spaces with southerly aspects that also are used in the summer.

Much of the land of the Haw River State Park is located on the south side of the Haw River, and therefore appears to have an overall average northerly aspect. Smaller patches do have southerly aspects. These areas may be considered for public use areas that may get more winter use.

Hydrology

The largest contiguous portion of Haw River State Park is bounded on its north side by the Haw River. This portion of the Haw River is part of the headwaters of the Cape Fear River Basin. Figure 14 illustrates the Cape Fear River's relationship to other river basins in North Carolina. Figure 15 illustrates the park's hydrologic context.

The Haw River flows generally to the northeast along the boundary of the park. Immediately to the east of the park property (based on the lack of a clearly defined center line in the hydrologic data used for this analysis as well as aerial photo analysis) the river does not appear to have a definable channel for nearly two miles. Approximately three miles after the river passes the park property the river turns to the southeast, eventually flowing into Jordan Lake, which flows to the Cape Fear Rive , which drains to the Atlantic Ocean.

The Haw River is classified by the N.C. Division of Water Quality as Class C, Nutrient Sensitive Waters from its source to a point four-tenths of a mile downstream of its confluence with Cane Creek in southern Alamance County. This includes the portion of the Haw River in the park and its vicinity.

Class C is an indication of waters protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquati life including propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. Nutrient Sensitive Waters is a supplemental classification intended for waters needing additional nutrient management due to being subject to excessive growth of microscopic or macroscopic vegetation.

Surface waters within the park are subject to jurisdictional oversight by the U.S. Army Corps of Engineers and the N.C. Division of Water Quality under Sections 401 and 404 of the Clean Water Act. Rare species within the park are subject to jurisdictional consideration under state and federal laws enforced by the N.C.

Sun reflecting off the water of the Haw River

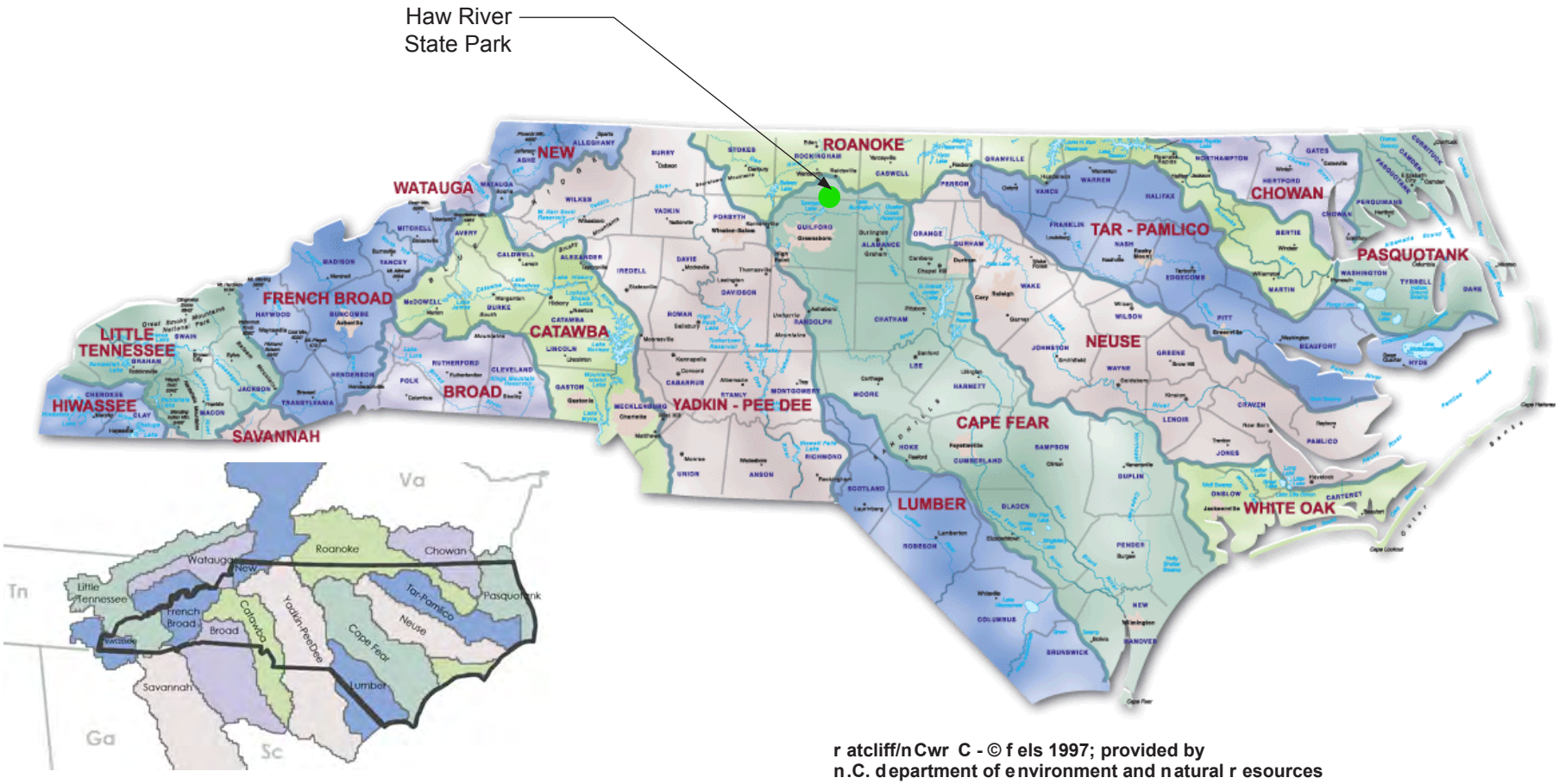
Wildlife Resources Commission, the N.C. Plant Conservation Program, and the U.S. Fish and Wildlife Service.

The N.C. Division of Emergency Management's N.C. Floodplain Mapping Program data, dated 2006, indicate the presence of flood hazard areas along the entire Haw River in and around the park. Therefore, a base flood elevation determination for specific area should be performed during the design and construction phases for any project in the park.

The U.S. Fish and Wildlife Service *National Wetlands Inventory*, published May 1999, identifies areas all along the Haw River within the park boundaries as well as in the park vicinity, as wetlands*. Based on input from park staff, additional wetlands occur in the park that are not mapped by the National Wetlands Inventory**. A wetland sketch map prepared for the "Richardson Project, Bluegreen Communities" in March 2007 indicates more extensive wetlands on the northwest corner of the Church Street Section as well as more extensive linear wetlands following the

* The National Wetlands Inventory defines wetlands as "lands transitional betwe n terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one o more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. (Source: Cowardin, L.M., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of wetlands and deepwater habitats of the nited States. U.S. Fish and Wildlife Service. 103 pp.)."

** According to the U.S. Fish and Wildlife Service, "The National Wetlands Inventory maps do not show all wetlands since the maps are derived from aerial photointerpretation with varying limitations due to scale, photo quality, inventory techniques, and other factors."



r atcliff/n Cwr C - © f els 1997; provided by
n.C. d epartment of e nvironment and n atural r esources
Office of Environmental Educatio

f igure 14: n orth Carolina r iver b asins

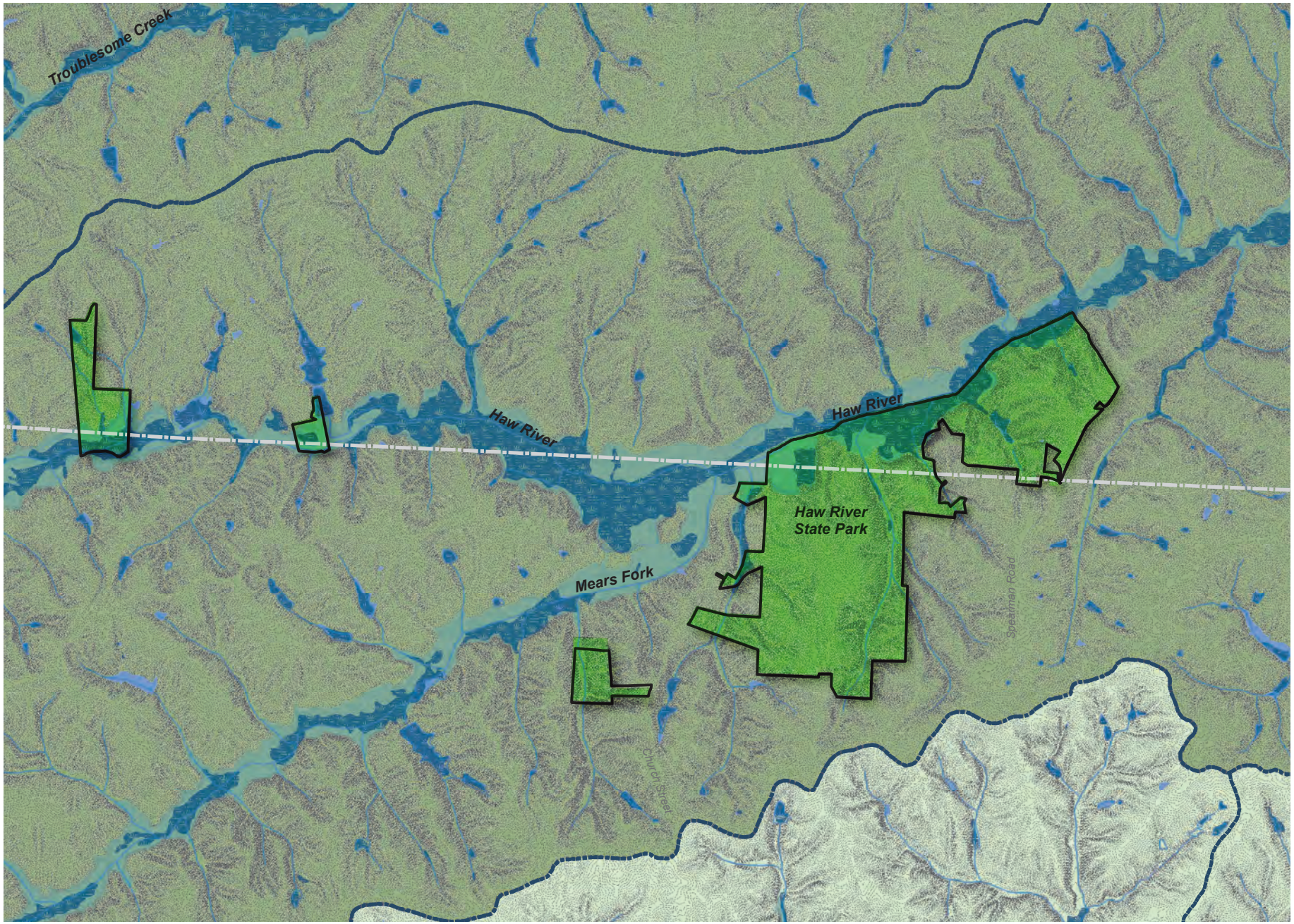
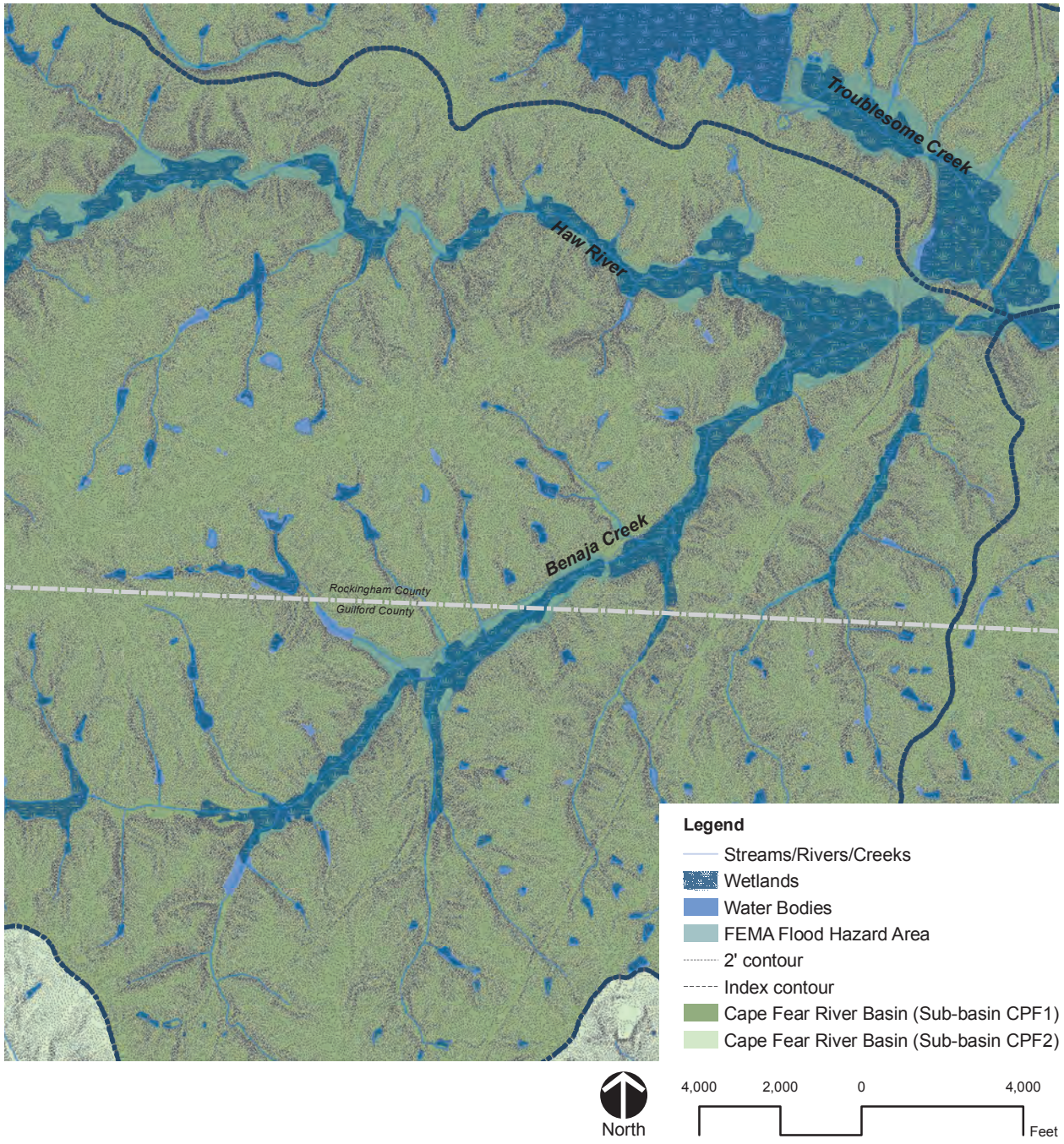


figure 15: Haw river state Park Hydrologic analysis



unnamed tributary that flows south to north into the Haw River on the eastern side of the Church Street Section. Wetland delineation for specific areas should be performed during the design and construction phase for any project in the park.

As of April 2009, Rockingham County stormwater regulations require a 50-feet undisturbed vegetative buffer on all perennial waters, including wetlands. As of the same time period, Guilford County stormwater regulations require a 30-feet stream buffer on all perennial streams, lakes, ponds, and intermittent streams. Impervious surface regulations for Guilford County would allow up to 70 percent imperviousness in the park and vicinity. The Haw River is a part of the Jordan Lake reservoir watershed. The Jordan Water Supply Nutrient Strategy establishes required reduction percentages for nitrogen and phosphorous within each of the three sub-watersheds of Jordan Lake. Where appropriate, existing and proposed development at Haw River State Park will be designed to conform to the requirements of the Jordan Water Supply Nutrient Strategy.

According to the North Carolina Administrative Code, 15A NCAC 2H.1000, most development activities within the park will require a State Stormwater Permit. Due to the presence of Nutrient Sensitive Waters, specific stormwater requirements for areas with this classification described in 15 NCAC 2B.0223 apply.

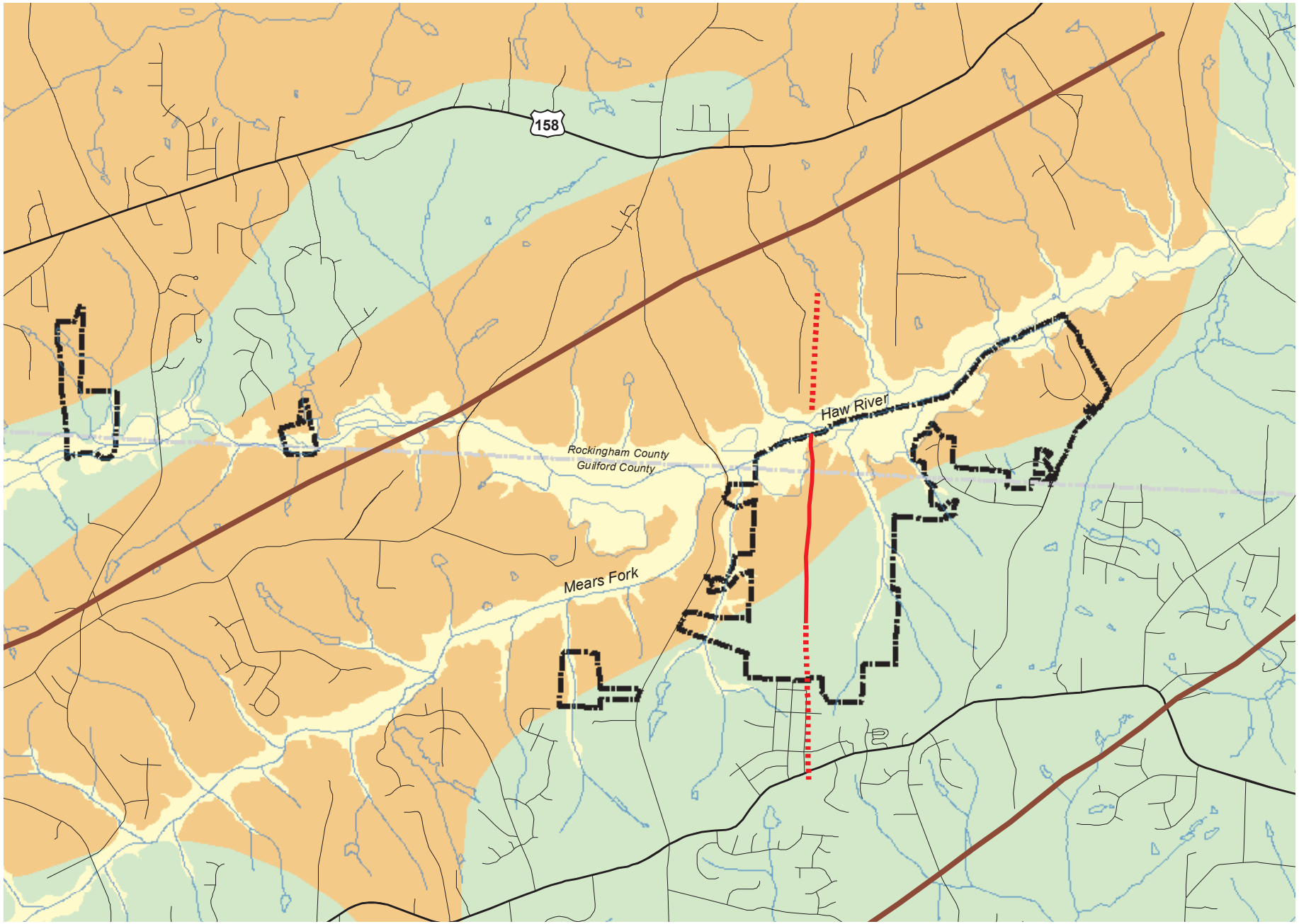
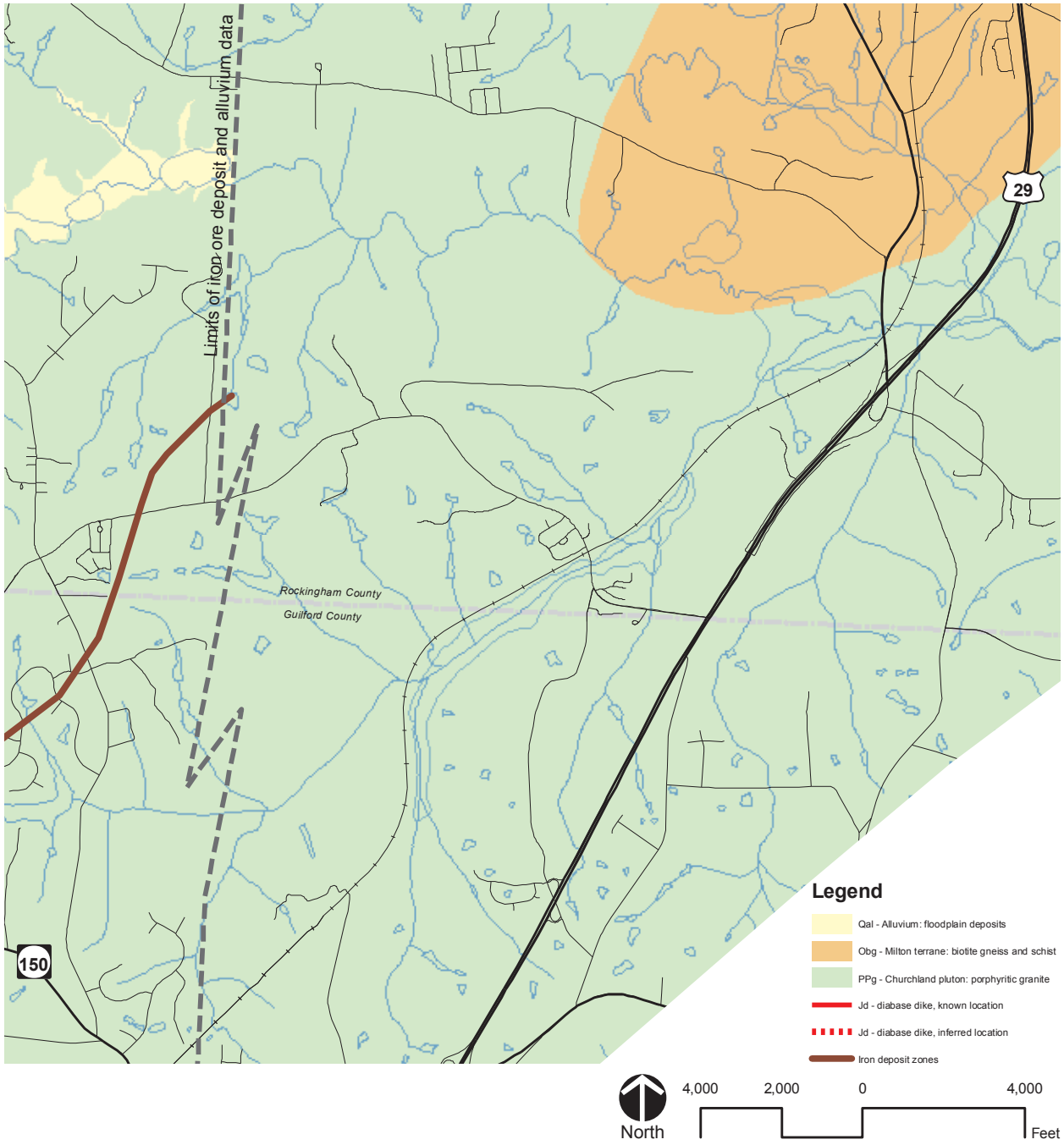


figure 16: **Haw river state Park and vicinity geology**



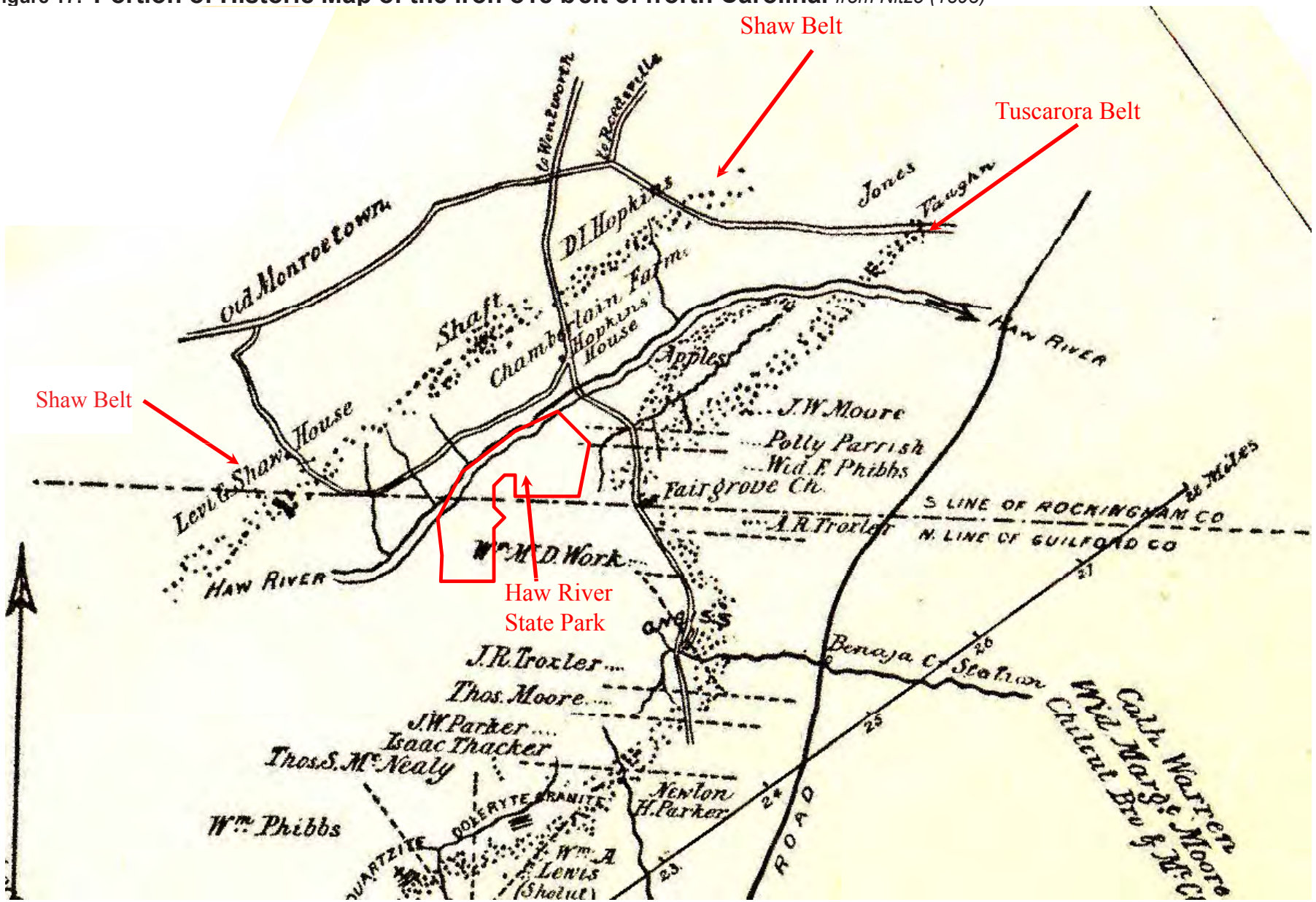
g eology

(*text and graphics by Phil Bradley, N.C. Piedmont Geologist, N.C. Geological Survey*)

Geologically, Haw River State Park is located in the Milton terrane (Hibbard and others, 2006). The Milton terrane consists of mainly amphibolite facies metasedimentary and metaigneous rocks of Ordovician age (approximately 450 million years old). Major rock types in the Milton terrane include biotite gneiss and schist, amphibolite, felsic gneiss, calc-silicate gneiss and quartzite (Hibbard and others, 1998). In the vicinity of the park, the Milton terrane is intruded by a porphyritic granite that is interpreted to be part of the Permian-aged (approximately 300 million years old) Churchland pluton (Carpenter, 1982 and NCGS, 1985).

Reconnaissance scale geologic data (Carpenter, 1982 and NCGS, 1985) and geologic data collected during a park visit in April 2009 were compiled for Figure 16. Based on the existing geologic data, the northwestern portions of the park are underlain by biotite gneiss and schist of the Milton terrane with the southeastern portions underlain by porphyritic granite of the Churchland pluton. The porphyritic granite is geologically younger than the biotite gneiss and schist unit and intrudes it. The site visit in April 2009 indicated that unmapped small bodies of porphyritic granite are present within the biotite gneiss and schist unit. A north-south trending dike of Jurassic aged (approximately 200 million years old)

figure 17: **Portion of Historic Map of the iron ore belt of north Carolina.** *from Nitze (1893)*



Portion of plate IX from: Nitze, H.B.C., 1893, *Iron ores of North Carolina,* Bulletin 1, North Carolina Geological Survey, pp. 239.

diabase was identified cutting through the Church Street Section of the park. Alluvium, the youngest geologic unit in the park, consists of unconsolidated sediments within river and stream valleys and when present covers the biotite gneiss and schist, porphyritic granite and diabase units.

The April 2009 site visit indicated that rock outcrops within the park are scarce and appear to be limited to areas underlain by the porphyritic granite. Areas underlain by the diabase contain abundant boulders and may contain outcrop. Areas underlain by the biotite gneiss and schist appear to be deeply weathered with a thick saprolite profile

The area underlain by the diabase may require additional geotechnical studies if future construction or infrastructure is planned on top of or across the unit. Diabase, compared to other rock types in the park area, is very hard and may require blasting for removal and may adversely effect construction activities and costs if not taken into consideration in the early stages of construction design and planning.

Diabase, although a very hard rock, often contains abundant water bearing fractures. Water supply wells installed within diabase are typically high yield wells. In contrast, the abundant water bearing fractures may cause the rapid infiltration of water and contaminants and should be avoided for the siting of waste disposal systems.

Iron Ore Belt of North Carolina and its relation to Haw River State Park

The area in the vicinity of the park is located within the Iron Ore Belt of North Carolina. The Iron Ore Belt consists of two northeast trending zones, identified as the Shaw belt (located northwest of the park) and Tuscarora belt (located southeast of the park, Figure 16). A portion of a digitally scanned historical map from Nitze (1893) with the approximate outline of Haw River State Park is provided as Figure 17.

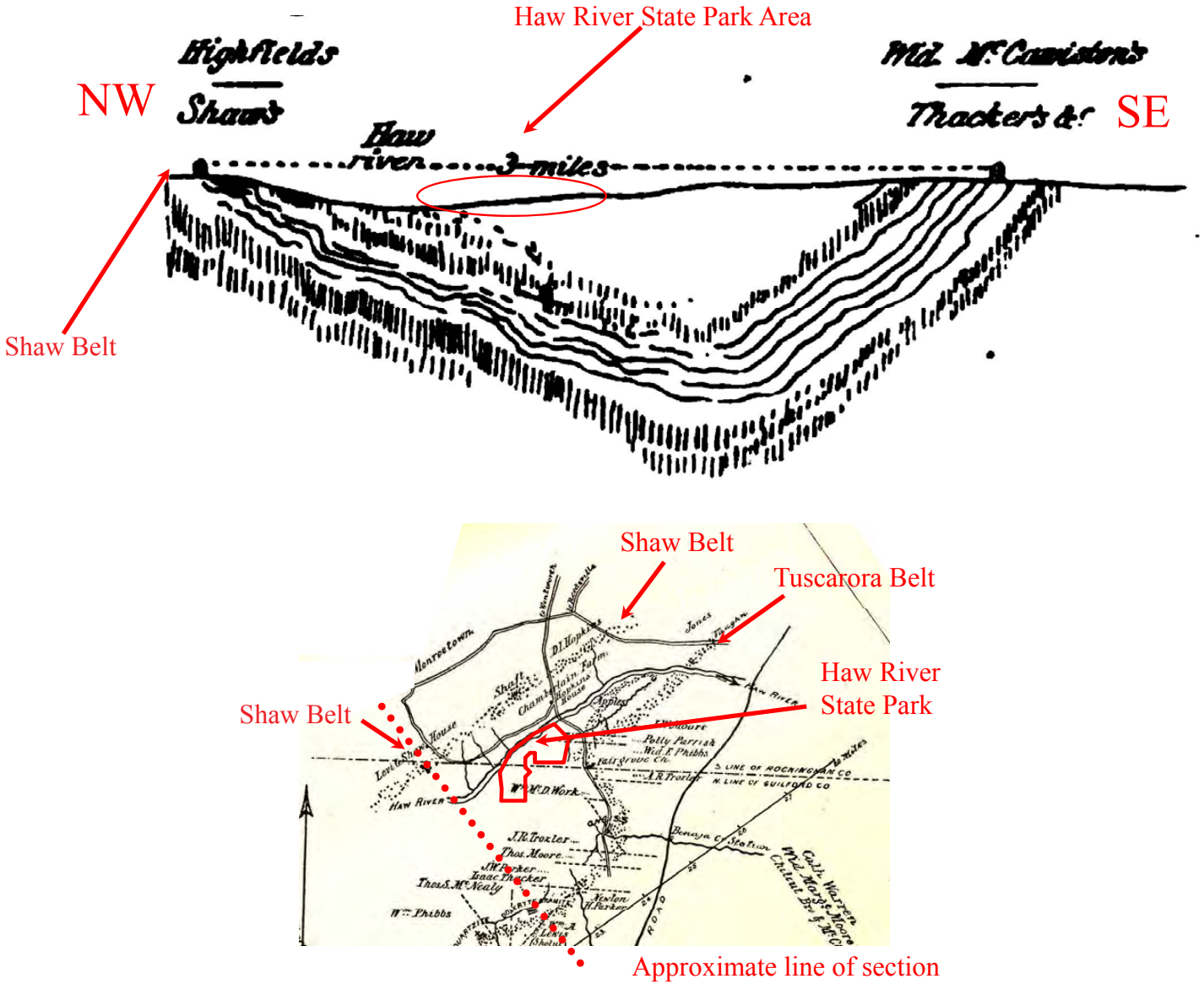
Nitze (1893) described the deposits of the Iron Ore belts in detail as consisting of granular titaniferous magnetite and/or hematite. The deposits typically occurred as stratabound, thin discontinuous beds and lens-shaped masses ranging from a few inches to up to eight feet thick within the saprolitic gneiss of the Milton terrane. Nitze (1893) interpreted the Iron Ore belts as being located on the limbs of a regional synclinal structure. A digital scan of figure 1 from Nitze (1893) indicates that the iron deposits likely are present at depth beneath the park. The location of the belts in Figure 16 indicate the area of maximum concentration of iron ore. Based on information gleaned from Figure 18 and the description of the extent of the iron ore by Nitze (1893), iron ore may be (or have been) present on the park property.

In 1871 Dr. J.P. Lesley, who later became the State Geologist of Pennsylvania ca 1890's, reported on exploration activities along the iron deposits for the North Carolina Centre Iron Company. The Lesley report (summarized in Nitze 1893) indicated the presence of "Old Revolutionary [war] Ore Pits" at the Shaw Mine (located immediately northwest of the Haw River in the vicinity of the Haw River State Park). According to Nitze (1893), the ore removed during the Revolutionary War from the Shaw Mine was hauled to Troublesome Forge (approximately 5 miles north).

During the April 2009 site visit, an excavated area (greater than 15 feet diameter by greater than 6 feet deep) with saprolitic biotite gneiss exposed in the excavation was identified on the Campbell tract. The shape and depth of the excavated area is consistent with that of prospect pits that commonly are found in areas of the state where economic minerals have been exploited. If the area of excavation is a prospect pit, it may have been dug during the Revolutionary War or from exploration efforts by the North Carolina Centre Iron Company in the 1870s to 1880s. Additional pits may exist on the park property; additional historical research is needed to confirm the origin of the excavated area

The North Carolina Centre Iron Company was actively mining two locations (Tuscarora and Dannemora mines) in the 1870s and 1880s. The Tuscarora mine was located approximately one mile north of Friendship in Guilford County. The Dannemora mine was located approximately 20 miles northeast of the Tuscarora mine in Rockingham County (five miles northwest of Brown s Summit). The Tuscarora Iron Works was constructed at the Tuscarora mine to forge ore from the Tuscarora and Dannemora mines.

figure 18: Scanned image of Nitze (1893) figure 1 showing synclinal structure of iron ore deposits and relative location of Haw river state Park



From: Nitze, H.B.C., 1893, *Iron ores of North Carolina,* Bulletin 1, North Carolina Geological Survey, pp. 239.

Beginning in the late 1880s and 1890s, the Lake Superior region of Michigan and Minnesota were producing vast quantities of iron ore. The smaller deposits of North Carolina (although of local economic importance) could not be economically competitive with the iron ore from the Lake Superior region. This was the end of the economic exploitation of the Iron Ore Belt of North Carolina in the Haw River State Park area.

Detailed Unit Descriptions for Figure 16 – Composite Geologic Map:

Sedimentary deposits
Qal – Alluvium: Flood plain deposits consisting of dark-brown, gray to white unconsolidated sand, silt, and clay; occasionally containing subrounded to well-rounded pebbles and cobbles. Occurs in river and stream drainages. In Haw River State Park, Qal underlies the wetland areas.

Igneous rock
Jd – Diabase dike: Black to greenish-black, fine- to medium grained, dense, consists primarily of plagioclase, augite, and olivine. Occurs as dikes up to 200 feet wide. Diabase typically occurs as spheriodally weathered boulders with a grayish-brown weathering rind.

PPg – Porphyritic granite (Churchland pluton): Light gray, medium- to coarse-grained porphyritic granite; composed of gray microcline phenocrysts up to 13 cm in diameter in a matrix of quartz, oligoclase, and biotite; also contains minor nonporphyritic granite. This porphyritic granite is considered correlative with the Churchland pluton.

Metamorphic rock
Obg – Biotite gneiss and schist (Milton terrane): Heterogeneous unit of dark-colored, medium- to coarse-grained gneiss and schist; locally interlayered with hornblende gneiss and schist and felsic gneiss; commonly with distinct layering and foliation; some portions are porphyroblastic; chiefly composed of biotite, quartz, feldspar, and sometimes muscovite and hornblende; intruded locally by pegmatite dikes.

r ock outcrop in the Church s treet s ection

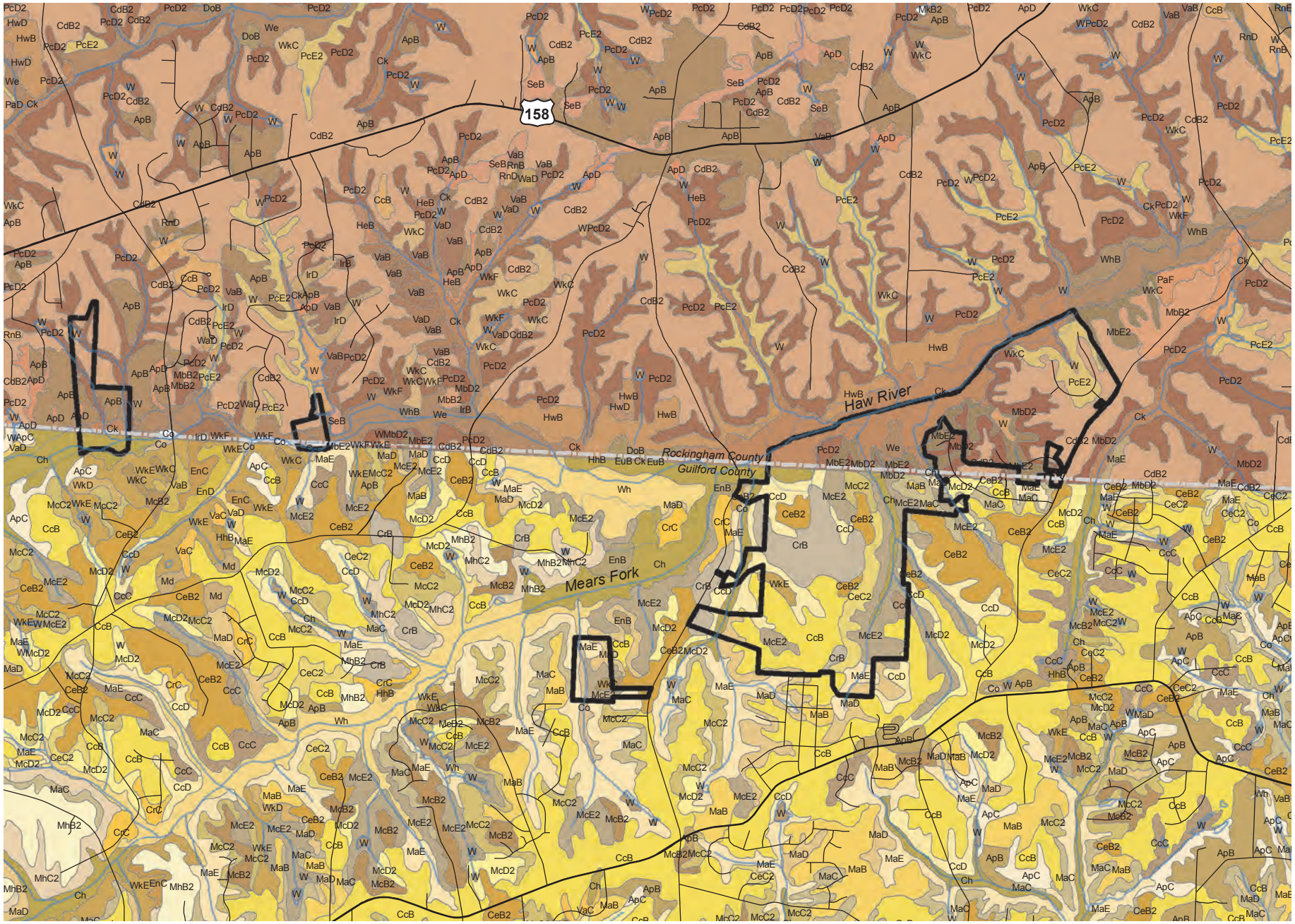
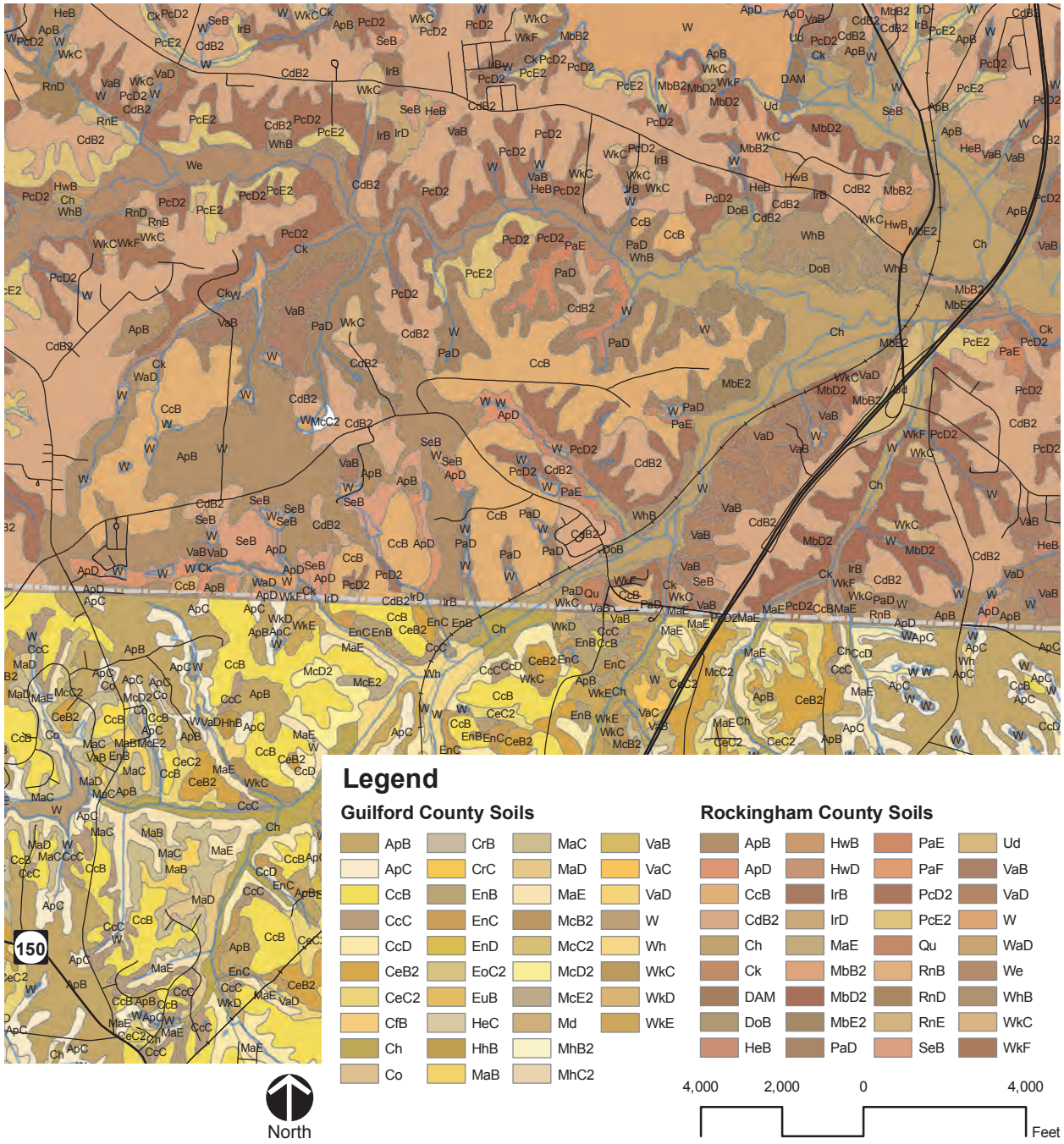


figure 19: **Haw river state Park and vicinity soils**



soils

Figure 19 illustrates soil data, prepared by the U.S. Department of Agriculture Natural Resources Conservation Service for Guilford County, digitized from the 1977 Soil Survey of Guilford County, N.C., and for Rockingham County, digitized from the 1992 Soil Survey for Rockingham County, N.C.

The two soil surveys describe 27 distinct soil units within the current Haw River State Park boundaries*. The predominant soils in the upland areas of the contiguous park site are of the Cecil, Coronaca and Madison Series.

Soils analysis is useful in determining areas suitable for the development of facilities and trails. *The Sustainable Sites Initiative: Guidelines and Performance Benchmarks (Draft 2008)* is used as a guide in this master plan for sustainable land design. As described in Table 2, the guidelines describe preservation of threatened or endangered species habitat, protection of floodplain functions of riparian zones as well as limited disturbance of prime farmland soils, unique soils, and soils of statewide importance as prerequisites to sustaining most of the ecosystem services used to define sustainabilit .

Table 3 summarizes the soil types located within the current park boundaries and

* Note that these two soil surveys may have been mapped at different scales and with a different land use in mind, at different times, or at a different level of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

their hydric soil status, farmland classification as well as suitability for various development activities within the park.

In summary, four of the identified soil types within the park are considered hydric. These soils exist primarily in flood hazard areas.

Much of the land within and around the park is considered prime farmland or farmland of statewide importance based on soil analysis. Sustainable land design will limit impact to soils defined as prime farmland, unique soils, or soils of statewide importance to less than five percent of the total surface area of these soils. This includes grading, compaction and development with impervious surfaces.

Soils considered suitable for camp areas and picnic areas primarily are located to the exterior of the existing roadway on The Summit Extended Campus, in the recreation field area of The Summit, and along the greater portion, predominantly the ridge, in the Church Street Section. Suitable soils include the more gently sloped lands in the Cecil and Madison Series.

Though all soils within the park property are considered to have "somewhat" or "very limited" suitability for the development of local roads and streets, very few areas are considered limited for the development of paths and trails.

More detailed soils analysis will be required during the design and construction of any new facilities within the park.

table 2: site selection Prerequisites from *the Sustainable Sites initiative: Guidelines and Performance Benchmarks (Draft 2008)*

sustainable site selection	
Prerequisite	Intent
Preserve threatened or endangered species habitat	Avoid development of areas that contain habitat for species identified on federal or state threatened or endangered lists to promote biodiversity
Protect and restore floodplain functions of riparian and coastal zones	Avoid development and disturbance in sites with high risk of flooding to protect the floodplain functions of landscapes adjacent to rivers, lakes, and coastal zones.
Limit disturbance of prime farmland soils, unique soils, and soils of statewide importance	Protect soils designated by the USDA Natural Resources Conservation Service as prime farmland, unique soils, or soils of statewide importance to ensure that land could be easily converted back to farmland for agricultural food production if necessary.

table 3: summary of soil analysis for Haw river state Park property

soil abbreviation	soil type	slopes	Hydric soil	farmland Classification	Camp area suitability	Paths and trails suitability	Picnic area suitability	development suitability - small Commercial buildings	development suitability - local roads and streets	County
ApB	Appling sandy loam	2 to 8 %	No	Prime	Not limited	Not limited	Not limited	Not / Somewhat limited	Somewhat limited	G / R
ApD	Appling sandy loam	8 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	R
CcB	Cecil sandy loam	2 to 6 %	No	Prime	Not limited	Not limited	Not limited	Not limited	Somewhat limited	G
CcC	Cecil sandy loam	6 to 10 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
CcD	Cecil sandy loam	10 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
CdB2	Cecil sandy clay loam	2 to 8 %, eroded	No	Prime	Not limited	Not limited	Not limited	Somewhat limited	Somewhat limited	R
CeB2	Cecil sandy clay loam	2 to 6 %	No	Prime	Not limited	Not limited	Not limited	Not limited	Somewhat limited	G
CeC2	Cecil sandy clay loam	6 to 10 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
Ch	Chewacla sandy loam	No slope noted	Partial	Prime X	Very limited	Somewhat limited	Somewhat limited	Very limited	Very limited	G
Ck	Chewacla loam	No slope noted	Partial	Prime X	Very limited	Somewhat limited	Somewhat limited	Very limited	Very limited	R
Co	Congaree loam	No slope noted	Partial	Prime	Very limited	Somewhat limited	Somewhat limited	Very limited	Very limited	G / R
CrB	Coronaca clay loam	2 to 6 %	No	Prime	Not limited	Not limited	Not limited	Not limited	Somewhat limited	G
MaB	Madison sandy loam	2 to 6 %	No	Prime	Not limited	Not limited	Not limited	Not limited	Somewhat limited	G
MaC	Madison sandy loam	6 to 10 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
MaD	Madison sandy loam	10 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
MaE	Madison sandy loam	15 to 35 %	No	Not	Very limited	Very limited	Very limited	Very limited	Very limited	G
MbD2	Madison sandy clay loam	8 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	R
MbE2	Madison sandy clay loam	15 to 25 %	No	Not	Very limited	Somewhat limited	Very limited	Very limited	Very limited	R
McC2	Madison clay loam	6 to 10 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
McD2	Madison clay loam	10 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	G
McE2	Madison clay loam	15 to 25 %	No	Not	Very limited	Somewhat limited	Very limited	Very limited	Very limited	G
PcD2	Pacolet sandy clay loam	8 to 15 %	No	State	Somewhat limited	Not limited	Somewhat limited	Very limited	Somewhat limited	R
PcE2	Pacolet sandy clay loam	15 to 25 %	No	Not	Very limited	Somewhat limited	Very limited	Very limited	Very limited	R
We	Wehadkee silt loam	No slope noted	All	Not	Very limited	Very limited	Very limited	Very limited	Very limited	R
WkC	Wilkes sandy loam	4 to 10 %	No	Not	Very limited	Not limited	Very limited	Very limited	Very limited	R
WkC	Wilkes sandy loam	6 to 10 %	No	Not	Very limited	Not limited	Very limited	Very limited	Very limited	G
WkE	Wilkes sandy loam	15 to 45 %	No	Not	Very limited	Very limited	Very limited	Very limited	Very limited	G

notes:

Prime - All areas are prime farmland

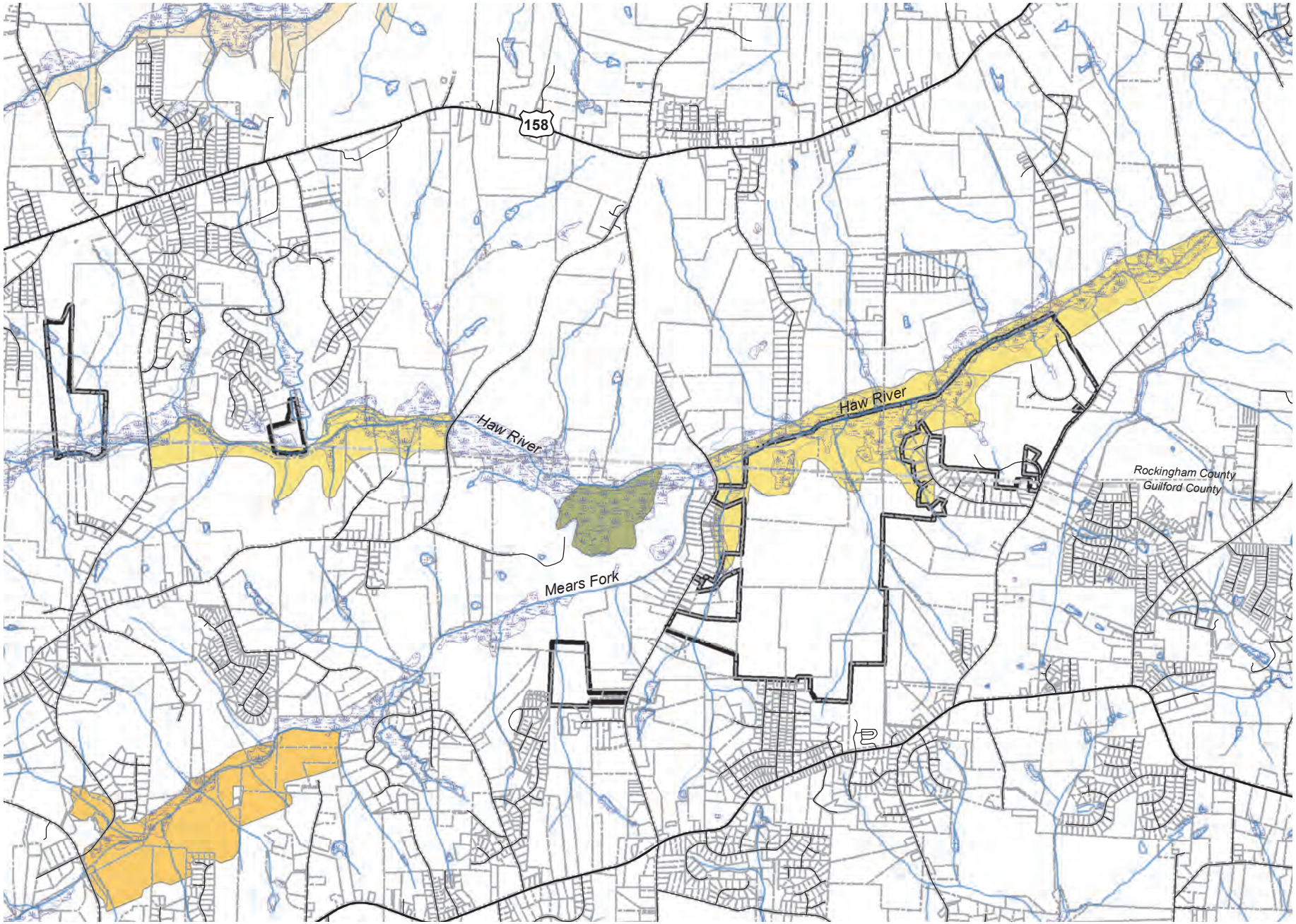
Prime X - Prime farmland with constraints (e.g. drained, protected from flooding, etc.)

State - Farmland of statewide importance

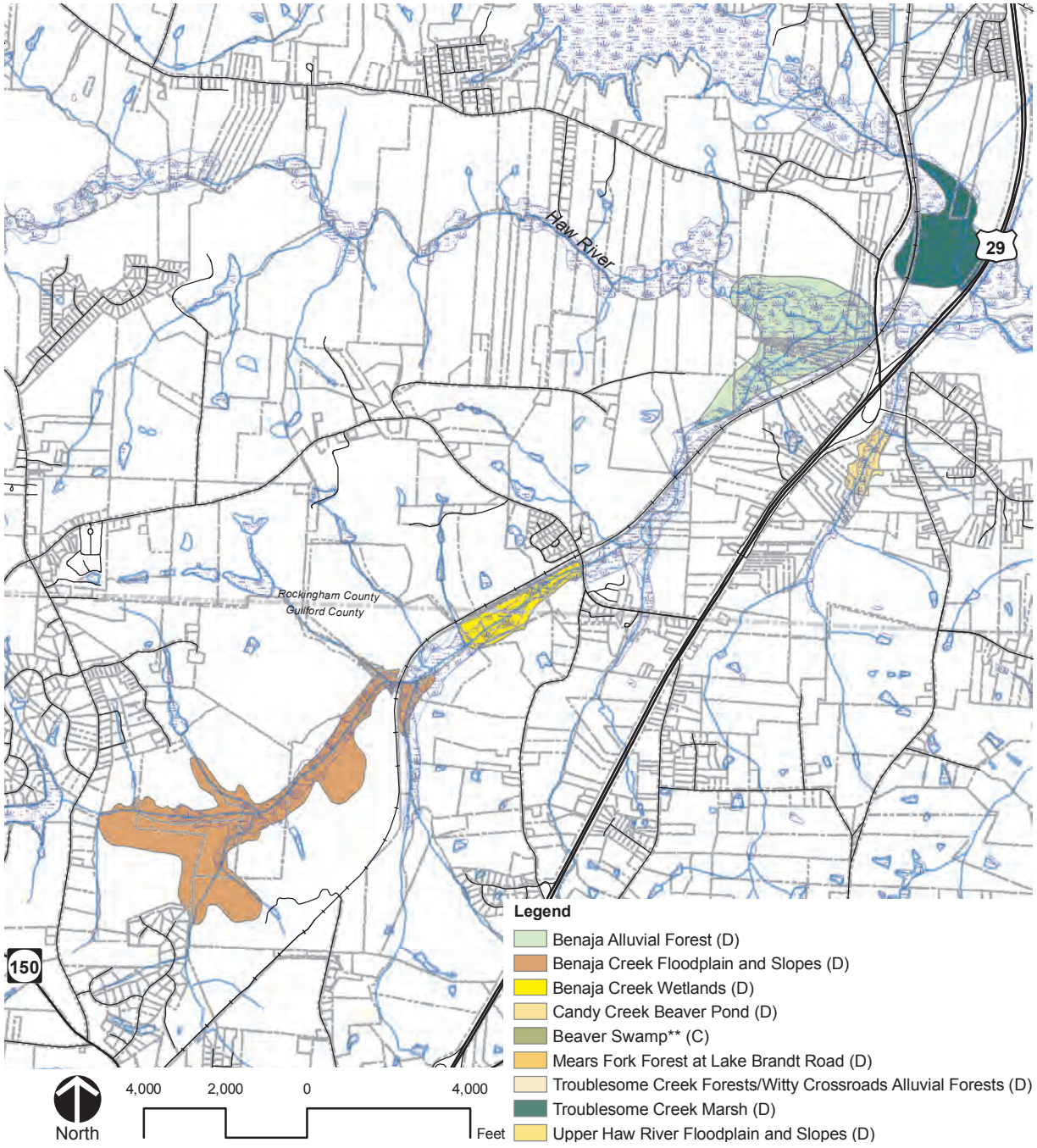
Not - Not prime farmland

G - Guilford County

R - Rockingham County



f igure 20: Haw River State Park and Vicinity Significant Natural Heritage Areas



f lora and f auna

The sections of the Haw River that border the Haw River State Park and are within its vicinity are considered part of the headwaters of the river. Areas of these upper portions of the river have been noted for their relatively broad floodplain that is uncommon for this region. Within this broad floodplain is an extensive system of wetlands noted for several high quality natural communities.

The N.C. Natural Heritage Program defines significant natural heritage area as terrestrial or aquatic, with significance based on the presence of rare species, rare or high quality natural communities, or other important ecological features.* Significant Natural Heritage Areas are ranked from level 'A' (national significance) to level 'D (local significance).

Figure 20 illustrates the significant natural heritage areas within the park and its nearby surroundings. The special status species and high quality natural communities in each area within the park are summarized in Table 4.

Haw River State Park contains portions of the Upper Haw River Floodplain and Slopes significant natural heritage area, a level 'D' natural area considered to be of county significance (Coomans and Bates, 1999).

* The North Carolina Natural Heritage Program notes that Significant Natural Heritage Area information can quickly become outdated. Therefore verification of information should take place before use of the data set in future design phases of a project to ensure data currency.

** The North Carolina Natural Heritage Program documentation refers to this area as Cone Swamp. It is referred to as Beaver Swamp in this document, based on local historical knowledge.

To the west of the main contiguous park property, and to the west of Church Street, is the Beaver Swamp significant natural heritage area. This area is a level 'C' natural area. Level 'C' sites are defined as "the best occurrences within a given Priority Region that are not already considered of national or state significance.

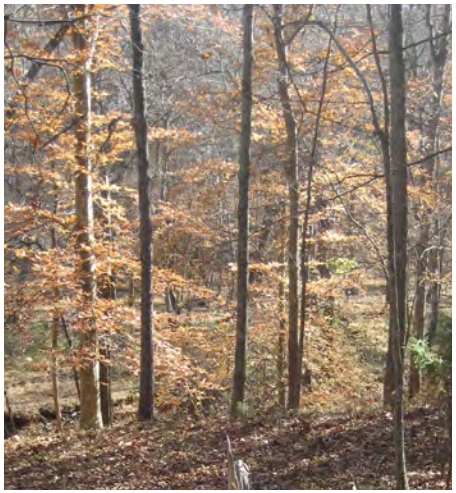
To the east of the park along the Haw River near its confluence with Troublesome Creek and Benaja Creek are the Troublesome Creek Marsh and Benaja Alluvial Forest, both of county significance (level 'D')

Coomans and Bates (1999) provides a recent, thorough description of the Upper Haw River significant natural heritage area, including high quality natural communities within the natural area. The natural area descriptions follow.

The Upper Haw River site "includes the Haw River, its floodplain and the adjacent slopes south of the river between Witty Road (SR 2351) and Cunningham Mill Road (SR 2426), excluding the section between Scalesville Road (SR 1002) and Sandy Cross Road (SR 1001), which lies in Guilford County." This site supports three high quality natural communities including Piedmont Alluvial Forest, Piedmont Semi-permanent Impoundments, and Mesic Mixed Hardwood Forest.

atamasco lily in the summit extended Campus

The Piedmont Alluvial Forests are supported in undisturbed portions of the relatively broad floodplains of this area. The flora is dominated by floo tolerant species that includes canopy vegetation such as *Acer rubrum* (red maple), *Platanus occidentalis* (sycamore), *Fraxinus pennsylvanica* (green ash), *Betula nigra* (river birch) and *Quercus michauxii* (swamp chestnut oak). The understory and shrub layer includes *Acer negundo* (box elder), *Asimina triloba* (common pawpaw), *Carpinus caroliniana* (ironwood), *Lindera benzoin* (spicebush), *Salix nigra* (black willow), and *Viburnum prunifolium* (black haw).



Hardwood forest in the Church street section of the park

Piedmont Semi-permanent Impoundments in this area are likely the result of beaver activity along the Haw River and its tributaries. These natural communities are lacking in canopy and therefore support a less shade-tolerant understory of *Alnus serrulata* (tag alder), *Cephalanthus occidentalis* (buttonbush), and *Hibiscus moscheutos* (crimson-eyed hibiscus), as well as herbaceous *Carex* spp. (sedges), *Juncus* spp. (rushes), *Typha latifolia* (cat-tail), and *Peltandra virginica* (green arrow arum).

Undisturbed north-facing slopes of the Haw River's floodplain support the Mesic Mixed Hardwood Forest. Coomans and Bates report that several pockets are of high integrity, but most areas have been impacted in the recent past by grazing or logging. This natural community supports a canopy layer of *Fagus grandifolia* (beech), *Quercus rubra* (red oak), *Liriodendron tulipifera* (tulip tree) on its lower slopes and *Quercus alba* (white oak) among others on its upper slopes. Understory vegetation includes *Cercis canadensis* (redbud), *Cornus florid* (flowering dogwood), *Oxydendrum arboreum* (sourwood), *Ilex opaca* (American holly), *Vaccinium* spp. (blueberries), and *Viburnum* spp. The herbaceous layer includes *Cimicifuga racemosa* (black cohosh), *Cynoglossum virginianum* (wild comfrey), *Polystichum acrostichoides* (Christmas fern), and *Uvularia perfoliata* (perfoliate bellwort) among others.

Burnette, et al (1991) describe the Beaver Swamp natural heritage area as a "large inaccessible swamp, an uncommon Piedmont community." Though this swamp is only a small part of the extensive wetland system in these relatively broad floodplains

of the headwater areas of the Haw River, this swamp stands apart due to its separation from the Haw River by a natural levee and its surroundings on its three other sides by uplands. This area supports a large Piedmont/Mountain Swamp Forest natural community. Though reportedly logged 30 to 40 years ago, according to Burnette, et al, the area "warrants further investigation and should be considered as a priority for protection." The site currently is in private ownership.

Two significant natural heritage areas are located to the west of U.S. 29 in the vicinity where the Haw River, Troublesome Creek, Little Troublesome Creek, and Benaja Creek all merge. According to Coomans and Bates (1999), the Troublesome Creek Marsh site supports an example of a Piedmont Semi-permanent Impoundment high quality natural community and the rare species *Lutra canadensis* (river otter). In this case, the impoundment is attributed to construction of U.S. 29 which borders this site to the southeast. The Benaja Alluvial Forest site supports a Piedmont Alluvial Forest high quality natural community and the rare species *Symplocarpus foetidus* (skunk cabbage). These two areas serve as valuable wildlife habitat for resident and migrant species. Both of these areas currently are under private ownership.

Burnette, et al, also noted that "a closer examination of the Haw River corridor should yield many other sites worthy of further survey." The same authors, at the time (1991), noted the Haw River "as yet unpolluted and not immediately threatened by ... proposed subdivisions." Since that time, areas in the vicinity have been developed or are proposed for development.

During evaluation of this area for a state park as a part of the New Parks for a New Century Initiative, N.C. Division of Parks and Recreation staff examined the upper Haw River corridor from just upstream of the U.S. 220 crossing to the U.S. 29 crossing. They focused their studies within the river floodplain, associated wetlands, adjacent bluffs and uplands. Resources of statewide significance noted in this study area included biological resources of Piedmont and Coastal Plain Mesic Forests, Piedmont and Coastal Plain Oak Forests, Piedmont and Mountain Floodplains, Riverine Aquatic Natural Communities, Upland Seeps and Spray Cliffs; geologic resources of dissected uplands and fluvial depositional features; and scenic resources of forests, reservoirs/lakes, rivers, and swamps (N.C. Division of Parks and Recreation, 2009).

This supports the need for further assessment of much of the land adjacent to the Haw River, in the vicinity of the park, for additional high quality natural communities and special status plant and animal species.

The One N.C. Naturally Conservation Planning Tool consists of data developed in response to a need recognized by N.C. Department of Natural Resources to

table 4: summary of special status species and High Quality Natural Communities in Haw r iver state Park

Common name	scientific name	state status	federal status
sPeCial status Plant sPeCies			
No Records			
sPeCial status aniMal sPeCies			
Carolina Ladle Crayfish	*Cambarus davidi*	SR	--
Four-toed Salamander	*Hemidactylium scutatum*	SC	--
HigH quality natural CoMMunities			
Piedmont Alluvial Forest			
Piedmont Semi-permanent Impoundment			
Mesic Mixed Hardwood Forest			

Notes:

State Status: E - Endangered; T - Threatened; SC - Special Concern; SR - Significantly Rare

Federal Status: T - Threatened; FSC - Federal Species of Concern

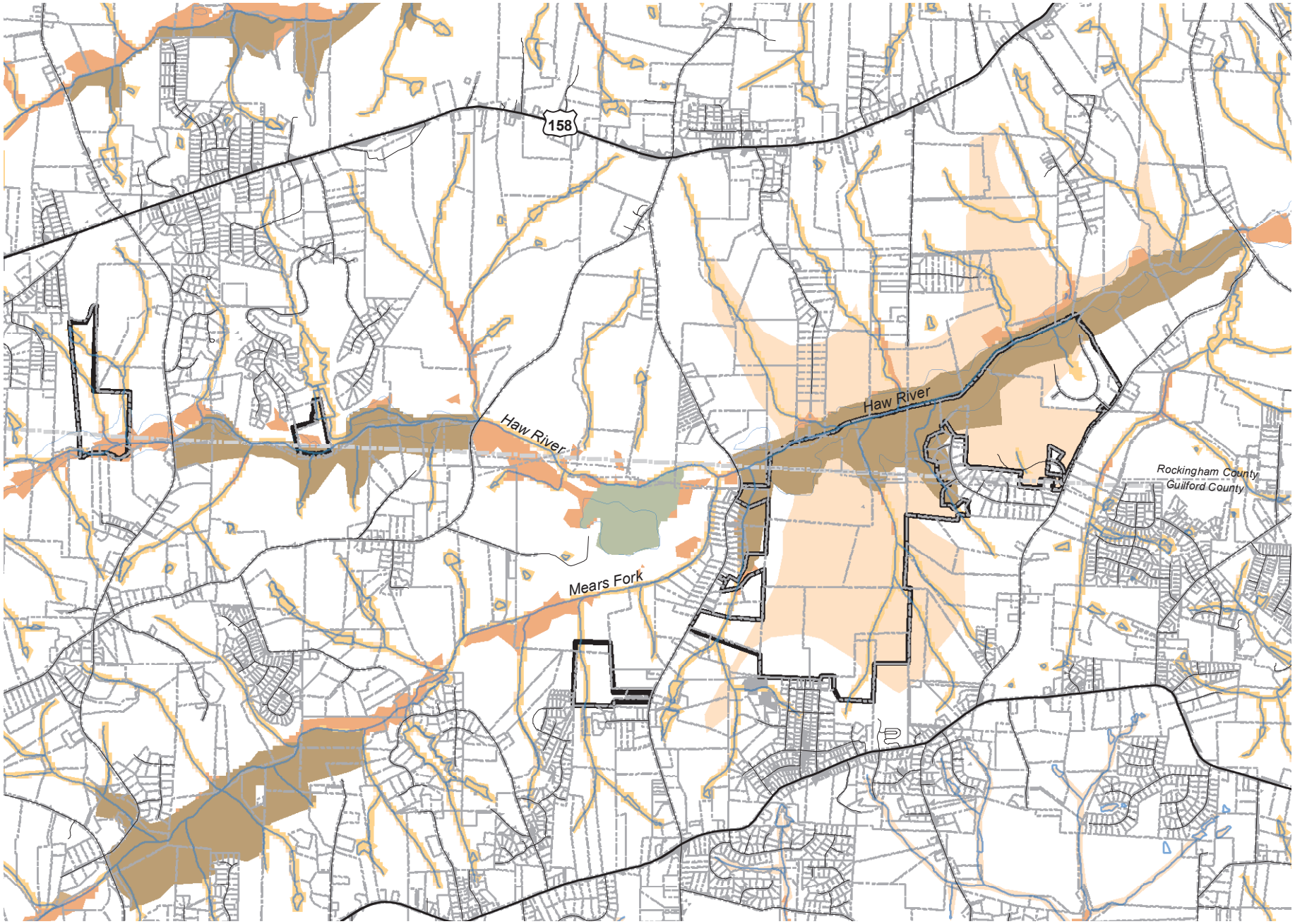
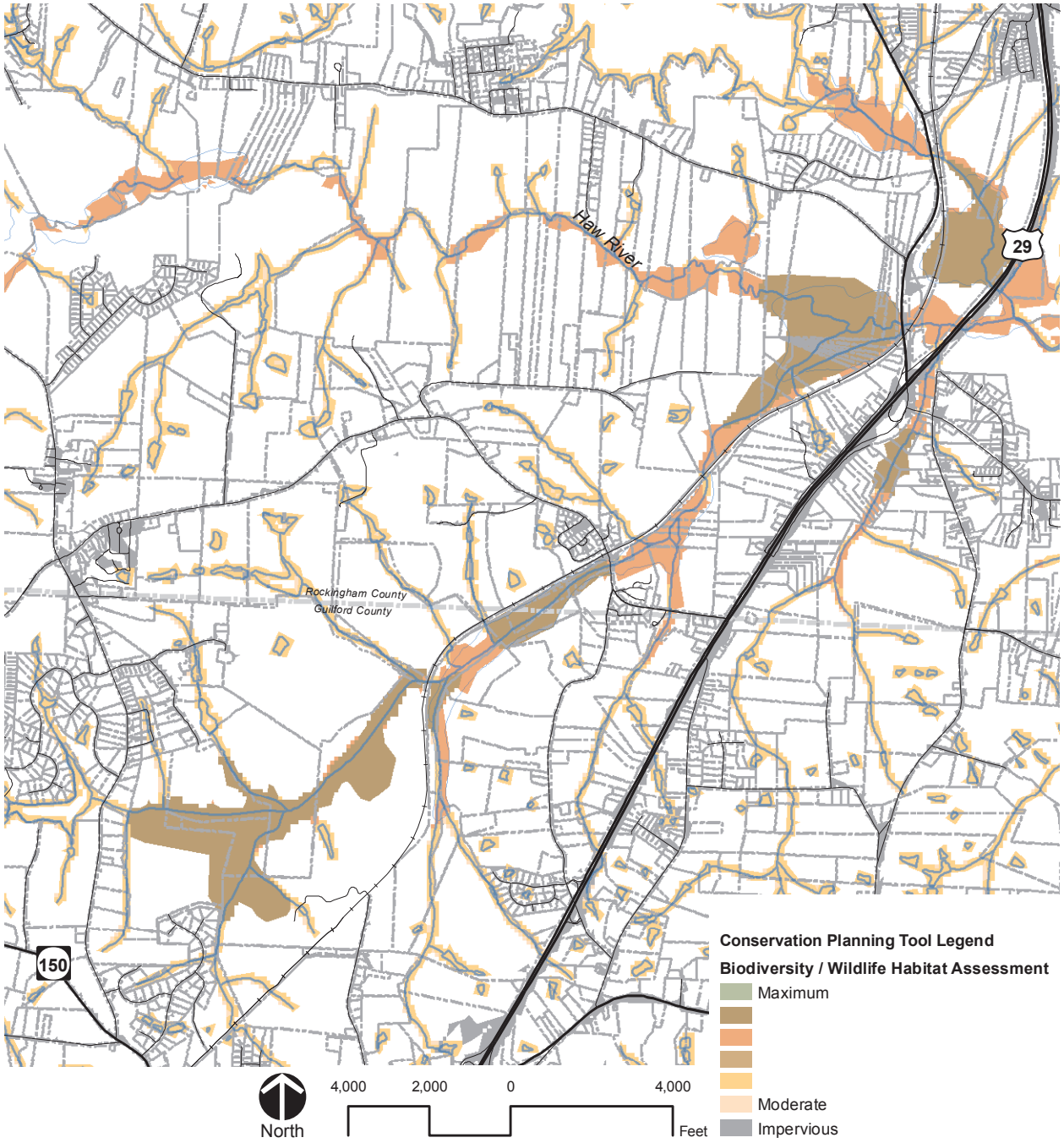


figure 21: Haw river state Park and vicinity Conservation Planning tool - biodiversity / wildlife Habitat assessment



coordinate statewide conservation efforts to preserve the state's finite natural resources. Data from several of these datasets was reviewed as a part of this master planning process. Figure 21 represents an example of this reviewed data, in particular an assessment of Biodiversity / Wildlife Habitat. Data used by the state to develop this planning tool included both terrestrial and aquatic significant natural heritage areas, free standing occurrences of elements of biodiversity, important bird areas as defined by Audubon, ecologically significant landscape units, wetlands, streams bioclassified as excellent to good, high quality and outstanding resource waters, and stream buffers among other data sets.

Most notable regarding biodiversity and wildlife habitat, much of the existing park property, both within The Summit and the Church Street Section of the property, contains very high value aquatic and terrestrial habitat, landscape function and connectivity. The previously noted significant natural heritage area, the Upper Haw River Floodplain and Slopes in and near park property, is considered to be of nearly maximum conservation significance in this assessment, and the Beaver Swamp is considered to be of maximum significance

site analysis summary

The Haw River State Park and its vicinity contain many opportunities for conservation and protection of representative examples of natural beauty as well as significant ecological features and recreation resources; provision of outdoor recreation opportunities; and provision of environmental educational opportunities that promote stewardship of the state's natural heritage.

The area along the Haw River corridor in the park and its vicinity is known for its broad floodplains as well as steep, north-facing slopes on the south side of the river that provide for a specialized ecosystem supporting high quality natural communities. These communities include Piedmont Alluvial Forests, Piedmont Semi-permanent Impoundments, Mesic Mixed Hardwood Forest, and Piedmont / Mountain Swamp Forest. Significant natural heritage areas of both local and regional significance exist along this portion of the river corridor.

In terms of land cover and land use, a number of areas adjacent to the park are of agricultural significance based on the state conservation plans as well as soils denoted in county soil surveys. Much of the park property is forested, some of which are predominantly hardwood forests considered to be of moderate to high conservation value.

Conservation and sustainable development value

Resource map overlays were used to define areas with significan conservation value as well as sustainable development value (amenable to development of park facilities) in and near existing park property.

In Figure 22, areas with conservation value are indicated in gray-green and represent significant natural heritage areas; wetland areas as defined by the National Wetlands Inventory; flood hazard areas as defined by the most recently available flood mapping data; 5 feet buffers; streams; areas with slopes greater than 10 percent; and biodiversity / wildlife areas of moderately-high to high conservation value based on the N.C. Department of Environment and Natural Resources Conservation Planning Tool.

Areas with sustainable development potential are indicated in orange. They were identified by overlaying areas with slopes less than 10 percent, soils noted in the most recent Guilford County soil survey with no limitation to development of a small commercial building, and soils noted in the most recent Rockingham County soil survey as somewhat limited for development of a small commercial building.

The areas of darkest gray-green have the most significant conservation value and the areas of darkest orange have the lowest conservation value (based on this system) as well as values indicating they are more sustainable areas for facility construction. The areas in the study area defined in dark orange were the areas of primary focus for design studies for facility development for the park. Areas previously impacted by farming or logging activities were also an initial focus in order to minimize impact. Figure 22 does not represent all conservation values and sustainable development potential but represents a coarse review from a master planning perspective. Other site constraints must be evaluated at each stage of design and construction, including known areas of archaeological significance that are not publishable due to their sensitive nature, as well as further evaluation for archaeological significance due to the known activity in this area.

shaping the Plan for the Park

A purpose statement for the Haw River State Park was developed by the N.C. Division of Parks and Recreation concurrently with the master planning process. The following section defines the purpose for Haw River State Park. This statement is an effective synopsis of the inventory, discovery and analysis phases of the master plan process in addition the technical review provided above. It also summarizes the foundation used for defining the program of use and the master plan design for Haw River State Park.

Park Purpose statement

Following its identification as a part of the state parks system s New Parks for New Century initiative, the N.C. General Assembly authorized Haw River State Park in 2003. The Haw River headwaters area near the Guilford/Rockingham county line was selected as a potential state park based on its natural resource

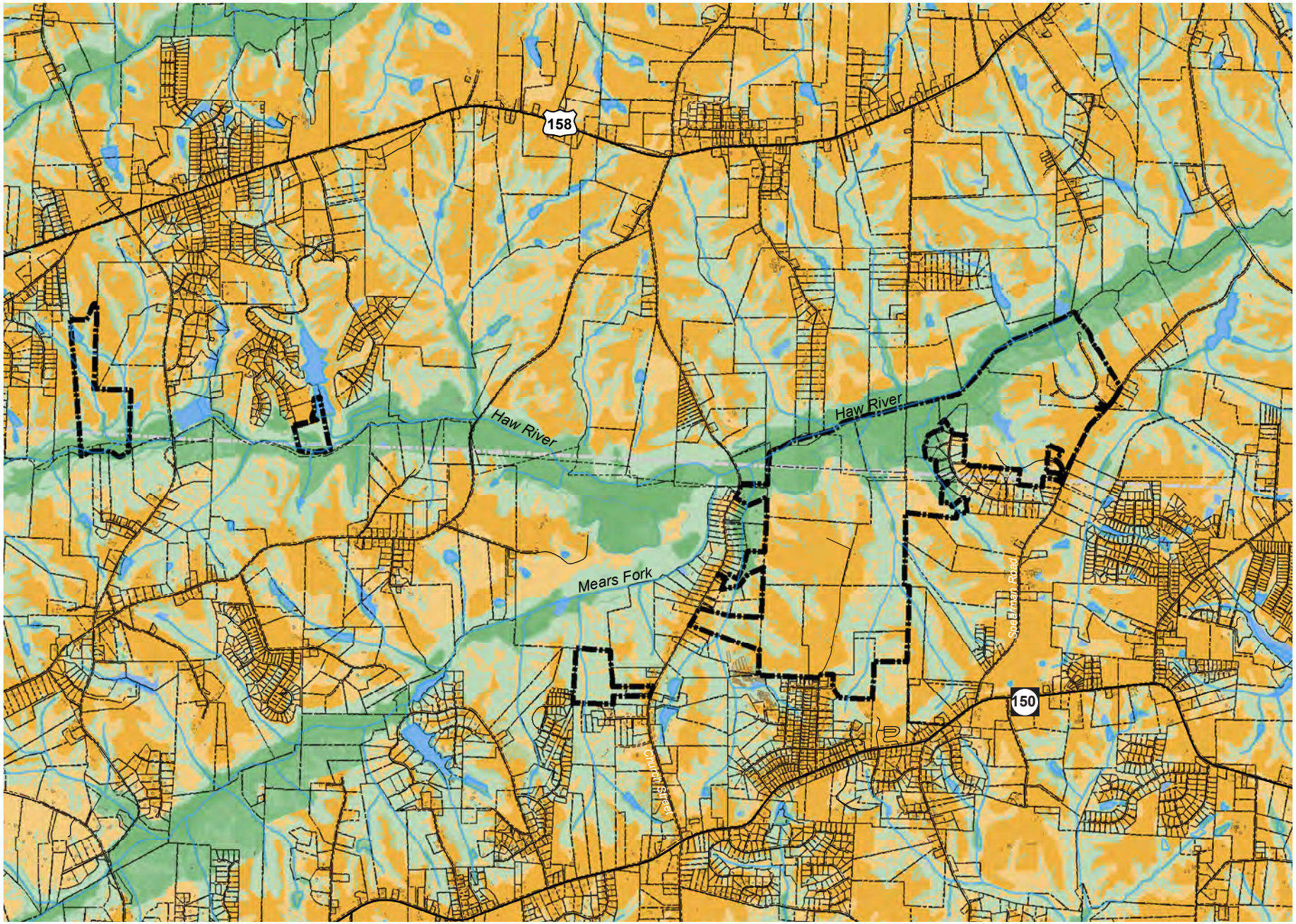
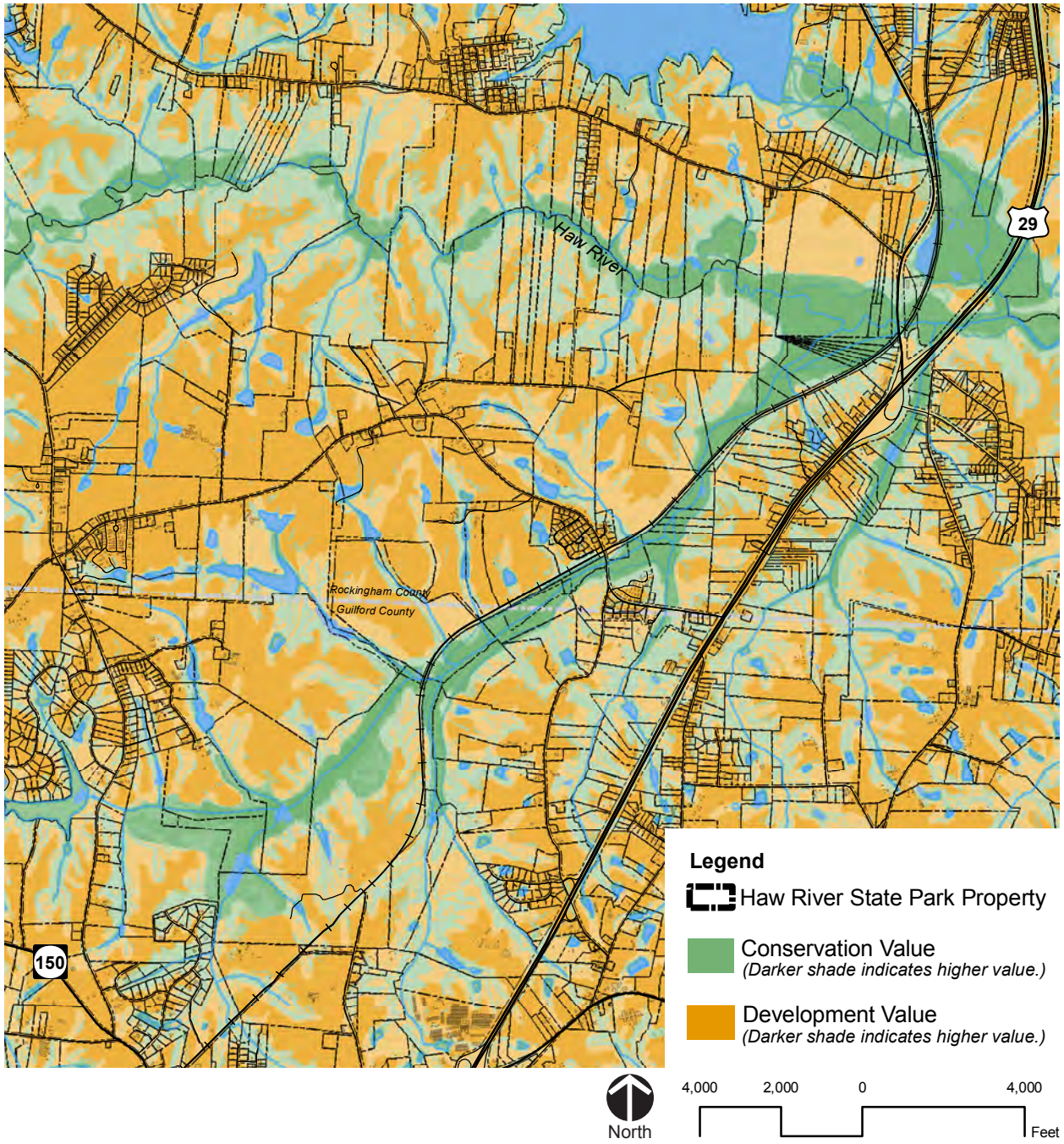


figure 22: **Haw river state Park Conservation and development value**



value, recreation potential and proximity to urban areas under-served by the state parks system.

Haw River State Park exists primarily to promote stewardship through environmental education, to protect the park's valuable biologic resources and to provide outdoor recreation opportunities. The park also protects valued scenic, archaeological and geologic resources. The N.C. Division of Parks and Recreation is charged with preserving these values and providing park experiences that promote pride in and understanding of North Carolina's natural heritage.

The Summit Environmental Education Center helps visitors to create and nurture awareness of the natural world through experiential education, thereby fostering a lifelong appreciation, understanding and connection with the natural environment. Environmental education curriculum is correlated to the N.C. Standard Course of Study and includes topics such as wetland ecology, forest ecology, cultural history, team building, astronomy and other nighttime programming. Trails weave throughout The Summit Environmental Education Center allowing opportunities for outdoor educational programs and experiences. Summer camps, special events and interpretive programs expand the variety of environmental education experiences available to the public.

The broad floodplain of the Haw River through the park is composed of an extensive system of wetlands with several high-quality natural communities. The

abundant vegetation in these wide riparian wetlands provides ideal habitat for amphibians, fish, mollusks, waterfowl and other species. Special status plant species found along this corridor include the regionally rare skunk cabbage. Large old beech, swamp chestnut oak, white oak, northern red oak, and green ash trees rise above the wetlands. Natural communities within the park include Piedmont/ Mountain Swamp Forest and Mesic Mixed Hardwood Forest (Piedmont Subtype). Areas along this portion of the Haw River serve as great blue heron rookeries and valuable habitat for other resident and migrant waterfowl. Wildlife in the park is varied and abundant, including rare species such as the four-toed salamander and the Carolina ladle crayfish

The park experiences strong regional demand for its varied recreational opportunities. This portion of the Haw River corridor is along the proposed route of the Mountains-to-Sea Trail. Other land and water-based regional trail systems interconnect with the park, including the North Carolina Birding Trail and the Haw River Trail – a hiking and paddle trail which starts just downstream of the park and links to Lower Haw State Natural Area. The potential for other low-impact outdoor recreational opportunities also exists.

Haw River State Park's piedmont forests with meandering streams and canopies of green offer a scenic oasis of respite from the region's growing urban areas. Park trails offer opportunities to experience a variety of natural settings including riverine wetlands and upland hardwood forests. Visitors to the park may find solitude and beauty along trails and wetland boardwalks, with opportunities to glimpse nesting great blue herons high in the treetops, watch wood ducks paddling silently through the braided floodplain, and hear the peeping of frogs mixed with the songs of birds. The pastoral quality of open, rolling fields scattered throughout the park hint at the agricultural past and together with the wetlands and upland forest communities, provides rich and varied scenic experiences for park visitors.

Limited studies of the archaeological resources of the park area indicate that pre-historic and historic Native Americans made use of the Haw River corridor and the adjacent uplands. Known Revolutionary War sites are also located near the park, and it is possible that travel routes through the park were used during the war. Several Revolutionary War era iron ore pits located in the vicinity of the park were situated to make use of the underlying Iron Ore Belt of North Carolina.

The geology of Haw River State Park is characterized by the metamorphic Milton terrane consisting of Ordovician age rocks approximately 450 million years old, and the igneous Permian age Churchland pluton, both of which run southeast to northwest through the park. Younger geological formations consist of sedimentary alluvial deposits of unconsolidated sand, silt and clay in the flood plains, wetlands and valleys throughout the area. A Jurassic age diabase dike runs north/south through the park west of The Summit property, which appears as rounded weathered boulders in a swath up to 200 feet wide in areas. The park is also located within the Iron Ore Belt, with local ore deposits being found within portions of the Milton terrane.

Haw river state Park Master Plan

introduction

Haw River State Park currently consists of 1,374 acres and extends intermittently for approximately 5.8 miles along the Haw River corridor.

As identified in the earlier circulation maps, points of access into the park lands are limited. For its size and proximity to large metropolitan areas, this is still a remote area and a very natural and unspoiled place.

A primary goal of this master planning process has been to preserve natural and cultural resources within the park. A secondary goal has been to site future programmatic elements and facilities in a manner that, to the best extent possible, ensures the protection of these significant resources of the park

The master plan also takes a comprehensive look at the entire park property, including possible acquisition properties within surrounding environs, in order to provide a clear development plan and guide for future activities. As outlined in the beginning of this document, the plan analyzes and evaluates data and extensive environmental information for the park land and vicinity, conveys a program of use, presents design proposals that respond to the program of use, and considers other factors that affect the management of the park.

With the advent of traditional park uses, increased park attendance is anticipated. With this in mind, needs and demands have been expressed which form a program to improve and expand current public use and recreation activities. Values have been articulated that protect and conserve significant ecological assets. Many opportunities exist for increasing the quality of user experience by developing new facilities for public access as well as expanding and enhancing existing facilities within The Summit. The main goal of this planning effort is to best locate proposed development in order to protect natural and cultural resources and preserve the park lands for future generations.

The focus areas defined for facility expansion or development within the Church Street Section, The Summit, and The Summit Extended Campus comprise a relatively small geographic footprint of the park property, designated primarily on previously impacted land with the fewest constraints to park facility development. In the Church Street Section, all proposed facility sites utilize a main spine road designated predominantly along land previously impacted by an old road bed and/or open fields, in order to minimize further impact by the use of road extensions. In The Summit Extended Campus, access beyond the immediate vicinity of the existing asphalt roadways on the eastern side of the area is extremely limited by steep topography and the presence of a Significant Natural Heritage Area that includes wetlands. Other areas are identified as being simply too difficult and challenging or too precious to compromise and are left in their natural state.

Old field in the Church Street Section of the park

Program of use

The framework for this master plan is based on a program of use thoroughly coordinated among the consultant, the N.C. Division of Parks and Recreation, the Haw River State Park Advisory Committee, other agencies, and public comments received during the planning process. The program of use outlines specific project opportunities within the existing park property as well as desirable opportunities that may be possible with additional land acquisition in future. The program of use defines th intent of the N.C. Division of Parks and Recreation to manage the Haw River State Park as one

park with two components. These shall be: 1) 'the greater park,' to serve traditional park uses, educational programs, and connection to state and regional trails including the Mountains-to-Sea Trail, and 2) The Summit Environmental Education Center, to continue as a center for environmental education, conference center, and training facility within the greater area of the park. Elements of the program of use within each of these areas include preservation of natural resources, elements of circulation and access, and specific user activities such as camping, picnicking and hiking. Another key programmatic element is to provide adequate facilities for maintenance and management by park personnel.

Upon completing the analysis phase, the consultant studied alternative development plans for the initial program of use that explored various concepts for depicting development options. These alternative studies were then critiqued and evaluated by the consultant and the N.C. Division of Parks and Recreation to establish a draft park design.

After a public presentation of the preliminary master plan, the key elements of the plan and program of use were posted on the N.C. Division of Parks and Recreation website for further input and comment. The final program of use was determined after review and evaluation of the alternatives, review and consideration of public comments on the draft master plan, and the many other environmental and regulatory factors that influence the park development.

Master Plan o verview

The master plan for the park is described in the following pages of this document. The illustrations and descriptions of the master plan convey proposed development in three sections: Church Street Section, The Summit and The Summit Extended Campus, as previously illustrated in Figure 8. The descriptions also indicate desirable facilities for the park that are considered land-dependent at this time.

On the master plan maps, colored/rendered areas illustrate areas where new facilities are recommended. Specificall , new buildings are indicated in red, existing buildings (when surrounded by addition or expansion plans) are indicated in gray, trails are indicated in dashed green (except where otherwise noted), and new roads are indicated in gray. A labeled plan is included at the introduction to each park section master plan. Subsequently, in the context of their written descriptions, certain areas are enlarged for more detailed legibility. Labels shown on the plans in *italics* denote existing facilities, trails or destinations. Labels shown in regular text (not in italics) indicate elements recommended by the master plan.

This master plan design is based upon the best available data*. Though space is available for noted design features and areas, more detailed soil, geotechnology, topographic, floodplain, wetland, ecological, archaeological and other studies will be warranted to fully assess feasibility. Planning is a dynamic process. The availability of more detailed information over time may result in a final built product that is di erent than what is depicted in this plan.

The master plan proposes several projects that will have impacts on surface waters and plant and animal habitats; however, design specifications for stream crossings, bu fers, building footprints, final building locations, etc., are not yet finalized An environmental assessment will be produced as part of the review process for this master plan, and the N.C. Division of Parks and Recreation will seek comments from all review agencies regarding potential regulatory requirements. As construction plans are developed, appropriate consultations with state and federal agencies will be undertaken to ensure compliance with all resource protection regulations. It will be the intention of the N.C. Division of Parks and Recreation to avoid or minimize impacts for all projects involving wetlands, streams, rare species, and their habitats. Appropriate delineations will be conducted for all stream crossings that are deemed by the N.C. Division of Water Quality and the U.S. Army Corps of Engineers to require permitting under Section 401/404 of the Clean Water Act. The N.C. Division of Parks and Recreation expects that all stream crossings will be constructed with the strictest adherence to all state and federal water quality regulations and permit requirements. Appropriate rare species surveys and consultations with the appropriate agencies will be conducted to avoid or minimize impacts and to ensure compliance with all regulatory requirements.

* The data used for master planning is not survey quality. Data utilized is summarized in the Resources and References section of this document.

Park t rails r eview

This master plan conceptually locates hiking trails within the park (described and illustrated in more detail in a later section). Within the Church Street Section, many proposed hiking trails are located on or in the vicinity of existing access paths or former logging trails. Usability of these existing paths as trails will need to be determined due to slope, drainage, and some existing erosion concerns. Other proposed hiking trails are located to provide recreational opportunities and access to various ecosystems through the park while protecting natural and cultural resources as much as possible. These trails are further described later in this section.

Long-term plans for the greater park include the potential for multi-use trails. These trails currently are dependent upon future land acquisitions and potentially, other regional partners as well.

For The Summit Extended Campus, the master plan recommends conceptual locations for new trails that initially can provide looped trails for interim day users, described later in this section, and phased for connection into the existing trails system within The Summit when the interim day use area reverts to part of The Summit. These trails and uses are illustrated later in this section.

Hiking trails are proposed within the Church Street Section and within The Summit area. The ability to construct longer distance trails and possibly to provide bicycle or equestrian trails is constrained by the park's limited acreage. If additional land can be acquired in the future, a comprehensive trail plan will be prepared.

t he g reater Park - Public u se a rea

Haw River State Park is a new park. It holds a primary role in the protection of wetlands and other ecologically and culturally significant land along the Haw River between U.S. 29 to the east and just west of Witty Road to the west. Facilities to support public use of the greater park based on the program of use have been sited within existing park-owned property. Based on land constraints, and reinforced by public input to minimize the footprint of the park in the Church Street Section, a number of facilities desirable for the greater park are currently dependent upon the acquisition of additional, suitable land. Facilities and use areas proposed for the existing park property are shown in Figure 23. Enlargements of specific areas for more detailed review are included in following figures. Pl ns for the larger park context as well as the park protection plan are included in the last pages of this section of the document.

Park Access

Figure 23 denotes all existing and currently proposed park access points. The main park entrance, providing access to the general public to the greater park, is proposed on the east side of Church Street, approximately 1.3 miles north of its intersection with N.C. 150. Potential park access to the future Mears Fork Section on the west side of Church Street is also denoted.

The Summit is accessed via Conference Center Drive off Spearman Road. The Summit Extended Campus will be accessed via Scarlett Lane, also off Spearman Road.

All accesses will be gated to provide park security after hours.

Circulation

The main park entry drive into the Church Street Section of the park is proposed as a two-lane asphalt road with the opportunity for bicycle lanes on both sides of the road. The road is proposed to wind along the topography through forest and open fields for approximately one mile to the visitor center, and then on for another short distance to the day use areas. A small stream crossing along the entry drive is proposed as a bridge or box culvert.

An after hours turnaround drive should be provided outside of the entry gate near the entrance at Church Street.

Access to the maintenance area from the entry drive and from Oak Arbor Road is proposed as a two-lane asphalt road. The group camping area access road is proposed as a two-lane gravel road.

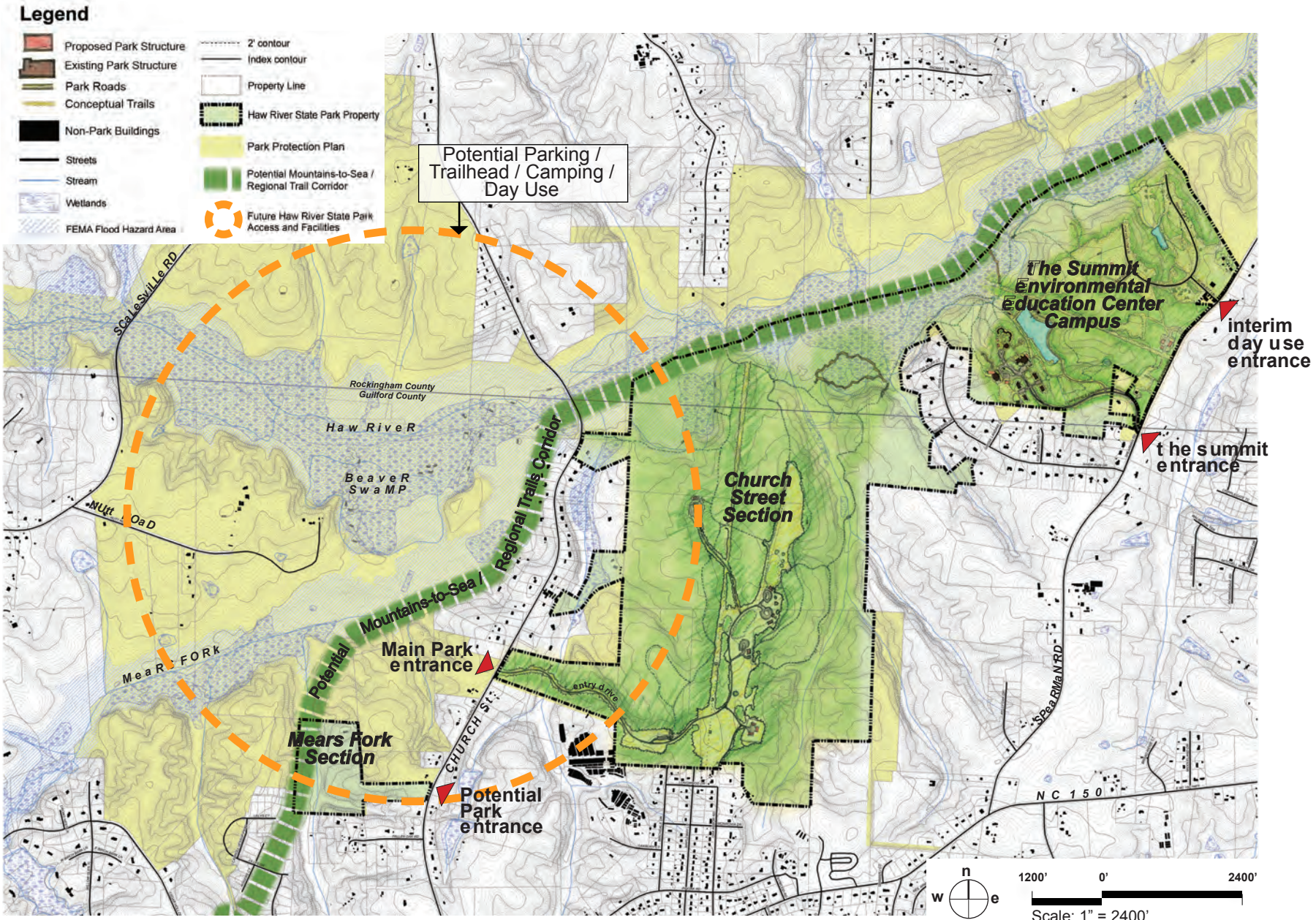


figure 23: **Haw river state Park Master Plan for the greater Park**

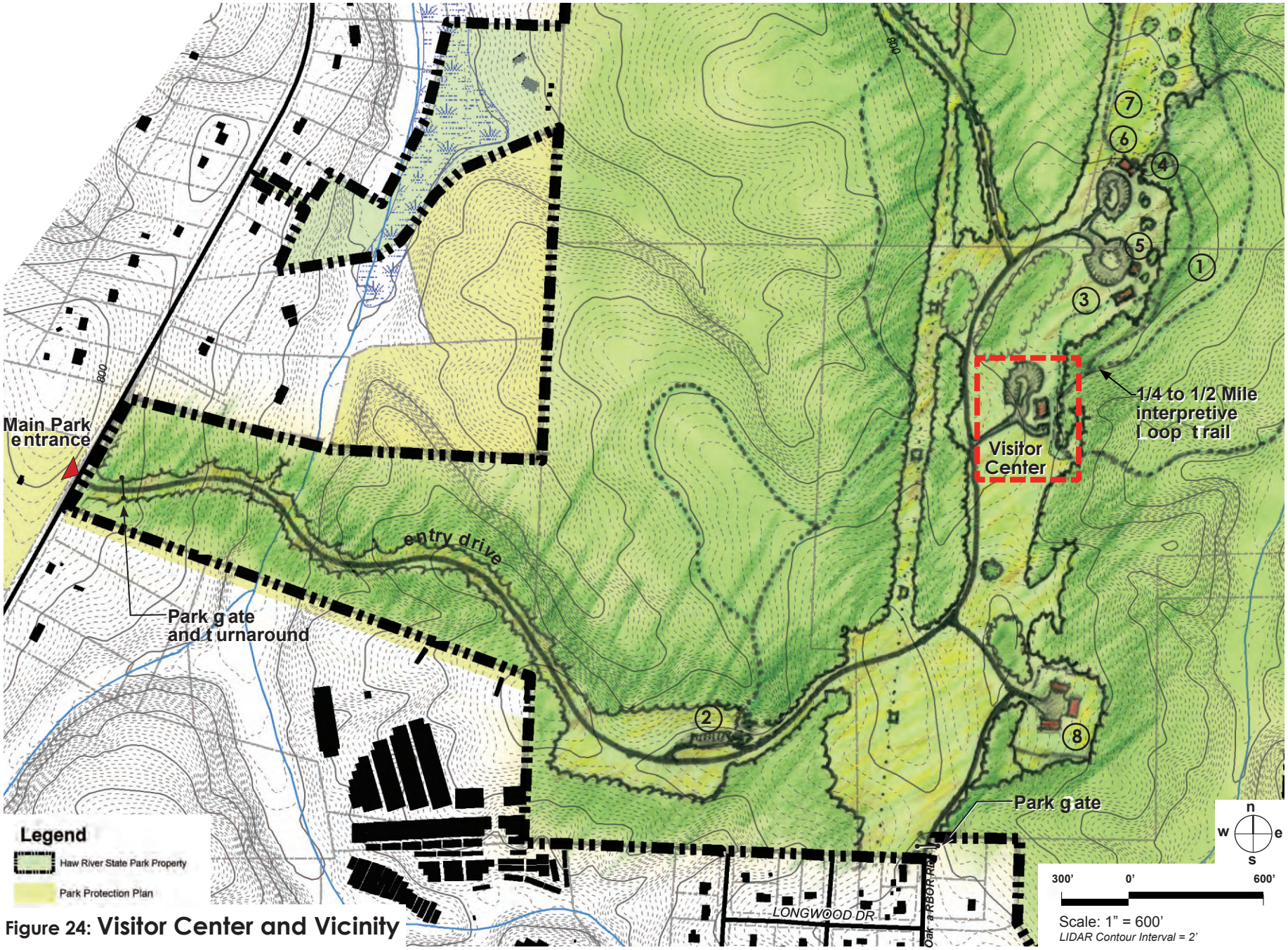


Figure 24: **Visitor Center and Vicinity**

Visitor Center

Figure 24 illustrates the master plan recommendations in the vicinity of the Haw River State Park Visitor Center.

The visitor center will serve as the primary location for general public contact for the greater park. It will include an exhibit hall, a sales area, a superintendent office, and other sta f areas. Since conference facilities are available at The Summit, this visitor center will not initially include conference or meeting rooms, classrooms or an auditorium. Based on future demand, the facility could be expanded in the proposed location to accommodate additional uses.

Parking for the visitor center is recommended to include 40 visitor spaces, 10 staff spaces and two spaces to accommodate buses or large recreational vehicles. The location identified for the visitor center could accommodate additional parking spaces if needed with future expansion of the facility.

The visitor center site will require electric, water, phone, internet, and wastewater utilities. Electric may be trenched during road construction under the entry drive. The N.C. Division of Parks and Recreation will explore renewable energy options for this project. Existing wells on site may be evaluated for potable water supply; however, it is anticipated that a new well will be required. An appropriate septic area will be defined for the site prior to construction, and will be sized appropriately to accommodate restrooms.

An approximately one-half mile universally-designed interpretive trail will originate and terminate at the visitor center, providing a primarily woodland experience as it winds through the adjacent woodland interior ①. Wayside exhibits will help interpret the sites along the trail. This trail will provide a convenient way for any user to experience the park in a short time period.

Trailheads and Day Use Areas

A trailhead is proposed off of the entry road about one-half mile into the park from the main entrance off Church Street. Access to this trailhead ② will be provided by a parking lot containing approximately 20 spaces. This trailhead will provide an access point into the trail system of the greater park. An orientation kiosk will provide a map and general information about the park.

Two day use areas are proposed just past the visitor center at the terminus of the entry drive in the Church Street Section. Each of the two day use areas will include a shelter as well as associated, uncovered picnic areas.

One of these areas ③ will include a shelter sized for six picnic tables as well as approximately 10 separate picnic sites with tables and grills tucked under existing large oak trees. These picnic sites should have close proximity to the shelter to allow rental of the entire space by larger groups. Parking for 32 vehicles will be provided.

The second day use area ④ will include a shelter sized for 10 picnic tables. It also will include approximately 10 separate picnic sites with tables and grills. This area will be supported by 40 parking spaces. The two picnic areas will share one toilet building to be located half way between the two shelters. The site will require electric, water, and wastewater utilities ⑤.

The northernmost of these two day use areas is proposed to include a major trailhead ⑥. This trailhead is proposed to lead to a wetlands-view boardwalk (described later) as well as to a looped system of trails throughout the park.

An open, multi-purpose field ⑦ is proposed immediately to the north of the day use areas. This site has been selected due to its flat topograph , excellent proximity to the day use areas, and its compatible use as an emergency landing zone (100-feet radius).

Maintenance Area

Figure 24 also illustrates the location and schematic layout for a maintenance area ⑧. This facility is intended to be the primary maintenance area for the greater park. This maintenance area is centrally located for easy access to existing and future areas of the park. Site selection for this maintenance area in the Church Street Section was based on suitable topography for the programmed use of the space, a location that could be screened from the entry

drive, an open area that would minimize impact to existing trees, and easy access in and out of the park without disturbing other visitor use areas. The designated area is approximately one and one-half acres and is located at the end of a spur road off the main entry drive. This spur road will be a two-lane asphalt drive constructed through an existing open area in order to minimize impact to surrounding trees. Secondary access will be a two-lane asphalt road connection to Oak Arbor Road, pending engineering evaluation of acceptable road weight limits for Oak Arbor Road.

This maintenance area will be enclosed by security fencing and will include two to three buildings. One of these buildings will include a maintenance office, carpentry shop, vehicle maintenance area and restroom facilities. A second building will include six-bay vehicle storage, dry storage and a wash bay with required environmental controls. The site allows space for expansion with a third similar-sized building.

The site will require electric, water, phone, and wastewater utilities. Electric may be trenched during construction under the entry drive. The N.C. Division of Parks and Recreation will explore renewable energy options for this project. Existing wells on site may be evaluated for potable water supply; however, it is anticipated that a new well will be required. An appropriate septic area will be defined for the site prior to construction, and will be sized appropriately to accommodate restrooms and equipment wash runoff.

Stormwater runoff will be directed through a filtering system, including an oil/water separator where appropriate, in order to cleanse the water prior to it entering the groundwater or surface waters of the site.

The site will be appropriately buffered from adjacent land uses, including the residential neighborhood south of the proposed site. Impervious surface will be kept to a minimum.

Group Camping

Figure 25 illustrates the proposed group camping area. Access to this area is proposed via a gravel, two-lane, approximately one-half mile long road to the northwest of the visitor center. The

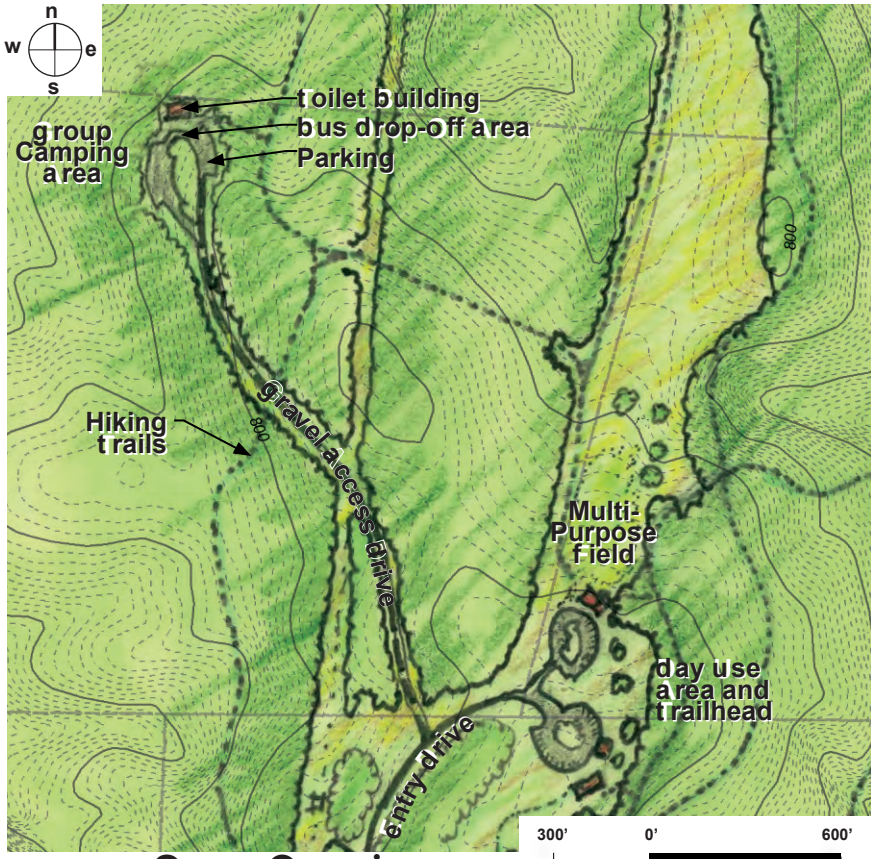


Figure 25: Group Camping and Vicinity

group camping area will consist of three large camp sites tucked under the forest canopy. All three camp sites will be sized for approximately 35-person groups. Two of the sites will be located in close proximity to each other to accommodate a combined use by larger groups when necessary. The third camp site will be located farther from the other two sites to provide a more secluded group camping experience.

One toilet building will be centrally located in relation to the three camping areas. Toilets will be a pump and haul system, thereby minimizing the need for septic area impact to the surrounding forest and nearby wetland areas.

Drop-off access will be provided as close to the use area as possible, with accessible parking spaces in close proximity. One bus parking space will also be in close proximity.

Two additional group camp sites of a similar size may one day be desirable for the park. The overall group camping area shown in Figure 25 could be expanded to five sites if future demand calls for it and other more suitable park land has not been acquired.

Tent and Trailer Campground
(Land-Dependent)

The program of use includes tent and trailer camping for Haw River State Park. It was determined through the master planning process, as well as reinforced by public input, that the existing land-base of the park is not sufficient to support a tent and trailer campground. Therefore, this facility is considered land-dependent. The ideal site for this campground would be in close proximity to the main park entrance on a relatively flat site since vehicular access is required, and with minimal impact to natural and cultural resources. Ideally the site would have opportunity for good trail and / or boardwalk access to the Haw River, the Mountains-to-Sea Trail and associated wetlands for interpretation and recreation.

The proposed tent and trailer campground should provide for 30 to 60 sites, ideally distributed along two loops and phased to assess demand, if practicable. The sites would provide a sense of privacy through spacing at approximately 150 feet on center.

Each campsite would have a tent pad, picnic table, lantern hook, and fire ring. At least half of the sites would likely be accessed by backup space parking, sized to accommodate a vehicle and trailer. The other half of the sites would be designed to accommodate a pull-through for longer trailers and large rigs.

These facilities will require potable water. It is preferred that all of the sites in this campground loop have individual access to potable water. However, if sewer hookup is required by code for any site that has water, spigots scattered at regular intervals throughout the loop will be used to provide potable water. A minimum of one site should be provided with a sewer hookup.

Electricity is desirable at all sites in a tent and trailer loop. Solar energy or other renewable energy options both for heating water and providing electricity will be explored whenever possible.

Providing trail access from this new campground to the Mountains-to-Sea Trail is recommended.

A sewer dump station is recommended along the road that would lead to the new tent and trailer campground.

New Interpretive Trails and Boardwalks

A system of looped hiking trails is proposed for the Church Street Section and is illustrated in Figure 26. Some of these trails are noted in the vicinity of former farm access paths and logging trails. Feasibility of these existing paths as trails will need to be further studied due to slope constraints and some existing drainage and erosion concerns.

A wetland overlook is proposed off the trails in the northern part of the site.

A new boardwalk is proposed in association with the wetlands on the north end of the Church Street Section. Access is proposed from a trailhead to be located near the day use areas at the end of the entry drive.

Mountains-to-Sea Trailhead
(Land-Dependent)

Haw River State Park is a primary destination on the Mountains-to-Sea Trail. Much of this trail in the vicinity of this park is land-dependent at this time. At least one trailhead for access to the Mountains-to Sea Trail will be provided from Haw River State Park; however, both trailhead and trail are land-dependent. For planning purposes, it is anticipated that vehicular access to this future trailhead would be provided by 20 to 40 parking spaces depending on the final location of the trail and accessibility from other points in the park.

Backpack Camping
(Land-Dependent)

Backpack camping sites for visitors to the park as well as through-hikers on the Mountains-to-Sea Trail are an important facility for the future of this park. They are dependent upon acquisition of appropriate land for the establishment of the Mountains-to-Sea Trail as well as appropriate land for a primitive camping area. Exact locations for either of these facilities have not been established on the master plan maps.

Initially three tent sites are desirable. More can be added based on future demand. The appropriate land for

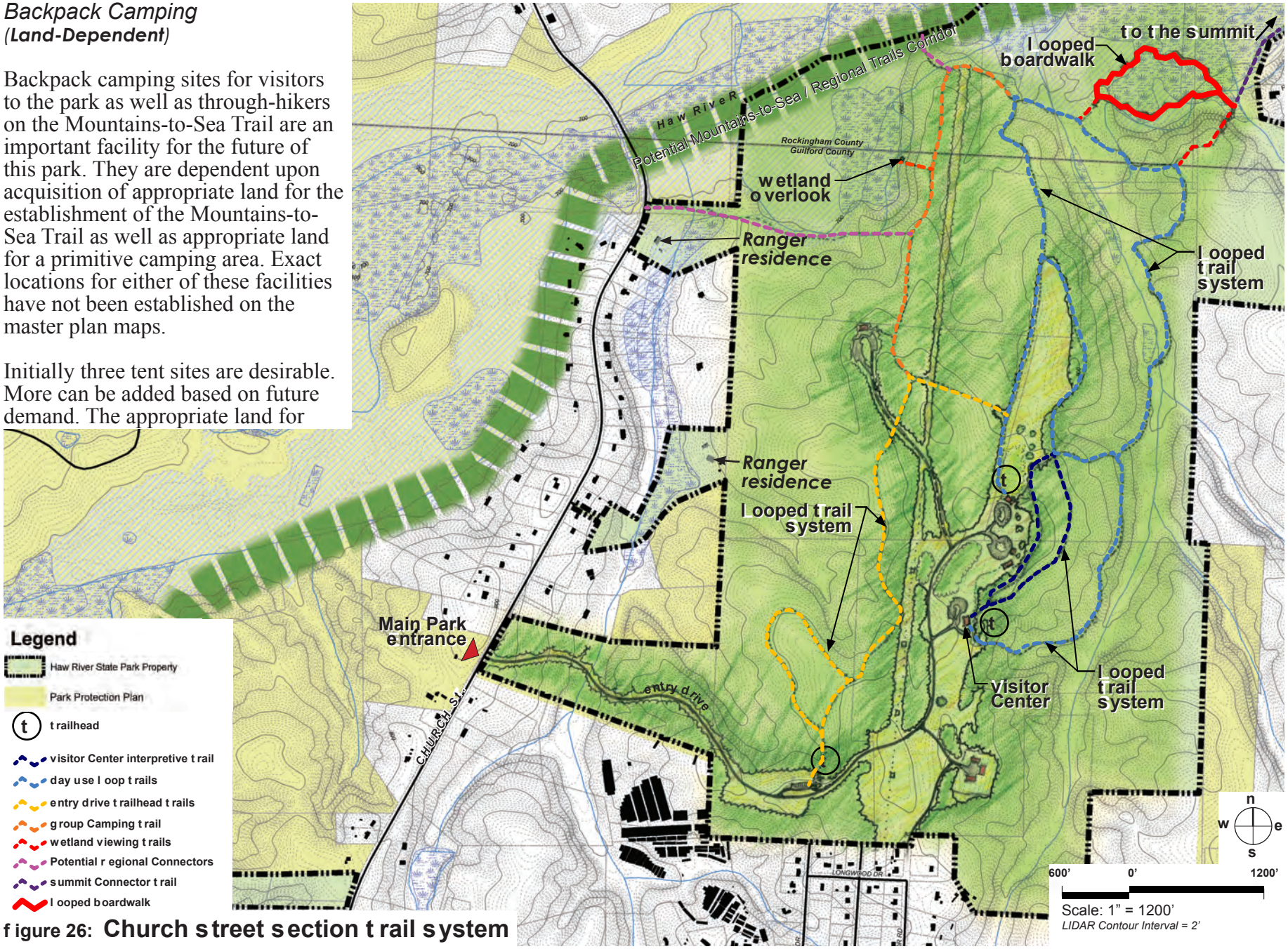


figure 26: Church street section trail system

these sites should provide for a backcountry experience through their location off a spur trail with adequate buffering to a main trail and any roads.

All-terrain vehicle accessibility to the backpack camping sites is desirable for maintenance by park staff. Other vehicular access is not recommended.

A pit toilet or composting toilet should be provided and maintained at a minimum of 50 feet distance from any surface waters.

Ranger Residences

The park has three existing ranger residences. With future growth of the park and new facilities more residences may be added to accommodate additional staff.

Separation of Activities

All new facilities should be located, at a minimum, 300 feet away from any park property line to provide adequate separation between park uses and adjacent property uses. Additionally, some screening is recommended to improve visual separation of activities in several locations in the park.

Native evergreen plantings are recommended at the corner of the park property adjacent to the existing greenhouse operation on the southwest side of the Church Street Section. This will screen views of the greenhouses and other structures from park visitors as they enter the park on the proposed park entry drive.

A natural planted buffer is recommended for screening of the proposed maintenance area from adjacent uses and roadways.

The Summit Environmental Education Center

An illustration of the overall proposed master plan for The Summit Environmental Education Center is shown in Figure 27. Enlargements of specific areas for more detailed review are included in following figures. The western, more developed area is referred to as The Summit Main Campus, and the eastern area is referred to as The Summit Extended Campus. Gates will be located at each road entrance off Spearman Road, shown in Figure 27.

Entry Sequence, Vehicular Circulation and Parking

Currently, the arrival sequence into The Summit Main Campus does not have a clear terminus. Figure 28 illustrates the master plan recommendations for a revised entry sequence. The proposed plan improves this with a new entry loop ① and drop-off area at a new environmental education shelter ②. This proposed improvement will impact an area of trees adjacent to the current gymnasium, but for the most part will be sited in the location of the existing tennis courts. The entry loop will include two bus parking spaces and the possibility for additional car parking spaces. The tennis courts have been rarely used. Based on low use and opportunity to improve circulation, the tennis courts are recommended for removal.

Improvements for bus circulation around the loop drive near the roundhouse are recommended. Reconfiguration of the parking in the area around the loop as well as some increase in pavement width to enlarge the radius should be able to achieve more efficient and safer bus maneuverability.

The Summit has needed overflow parking on a number of occasions. It is recommended that a detailed study of the parking area adjacent to the lodge's drop-off area be performed in order to safely maximize the parking opportunities associated with that building. Any parking lot reconfiguration should emphasize pedestrian circulation and safety around the campus. Redesign of this area should also maintain accessibility of all size vehicles for kitchen deliveries, refuse collection, and maintenance vehicles.

Additionally, it is recommended that the existing maintenance area be relocated to a site more centrally located between The Summit Main Campus and The Summit Extended Campus, to be

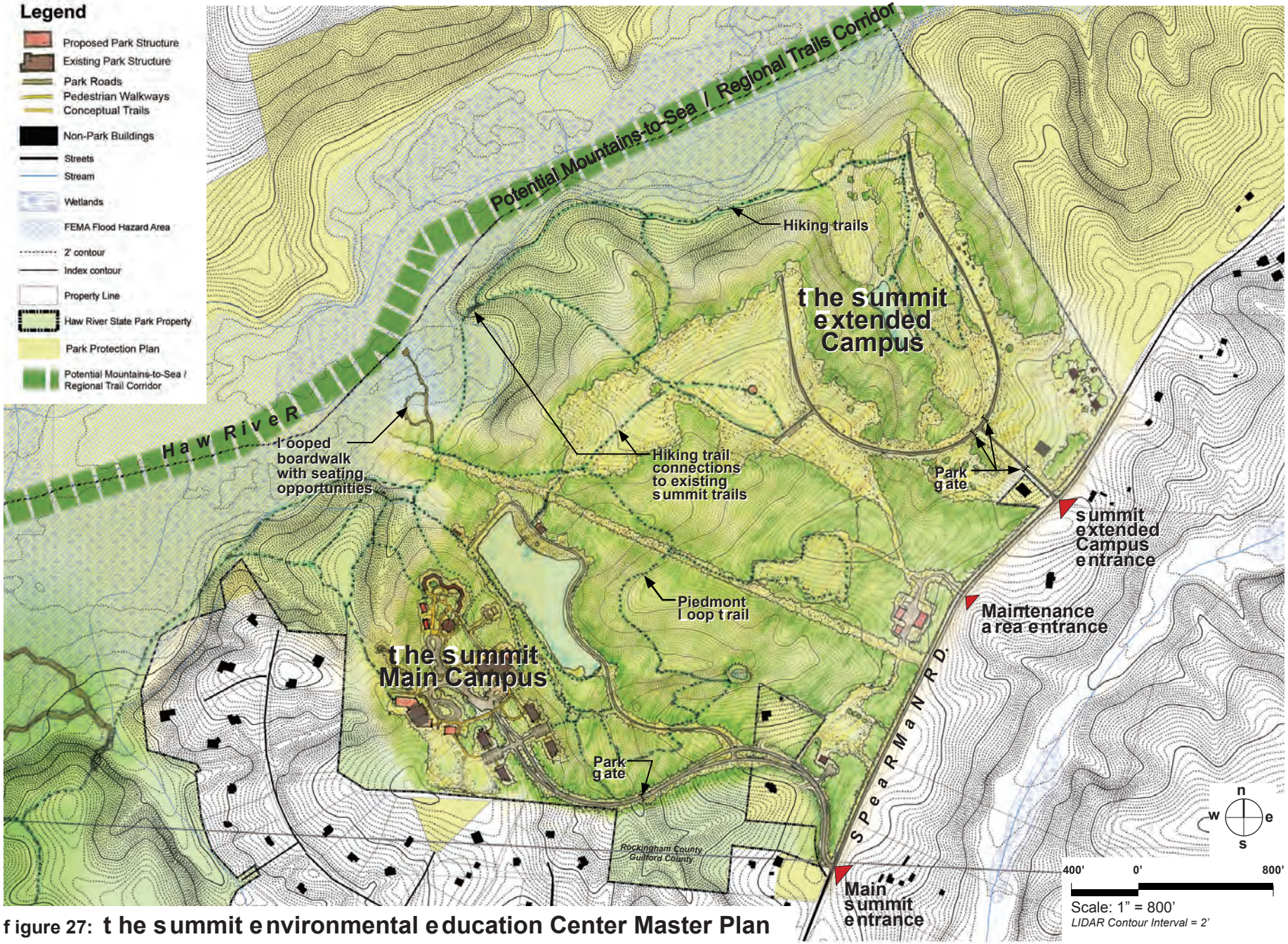


figure 27: the summit environmental education Center Master Plan

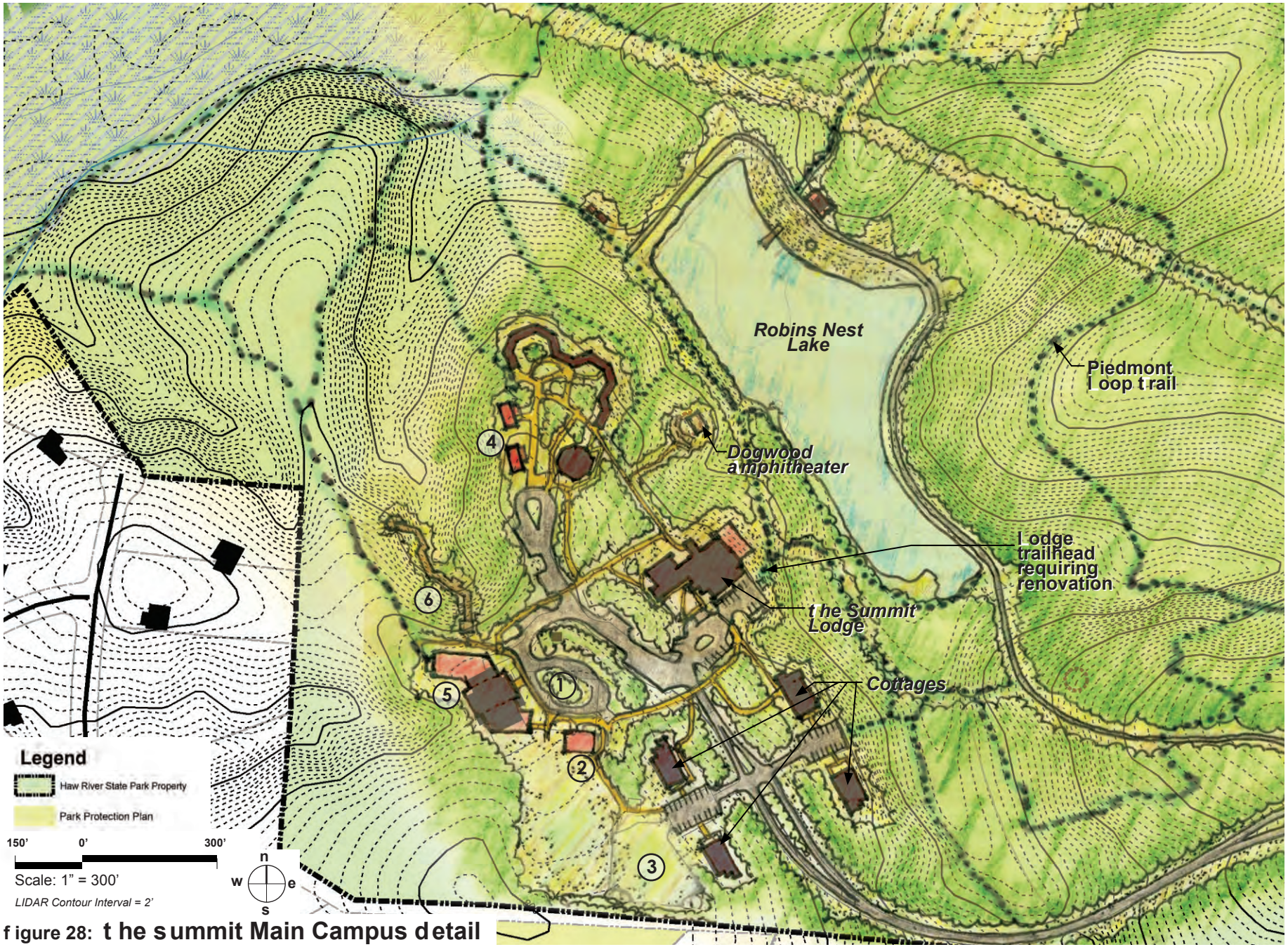


figure 28: the summit Main Campus detail

described in a later section. The site of the existing maintenance area and associated drives and parking areas can be converted to grassed overflow parking ③ that will blend in with the existing recreational field when not in use. Overflow parking is recommende to accommodate 40 vehicles at a minimum. This area should be screened from neighboring residential property using fencing and a dense, native evergreen buffer.

Campus Pedestrian Circulation

Figure 28 shows proposed main campus pedestrian circulation in yellow-orange. These routes are proposed as a means of interconnection between facilities, providing a pedestrian circulation system that is safe, accessible, attractive, environmentally sound and facilitates movement around the campus without disruption to conference or environmental education activities. Appropriate pavement marking and / or signage is recommended to denote pedestrian crossing at any intersection with vehicular circulation.

Some re-routing of existing Summit trails is recommended to establish the 'Piedmont Loop Trail'. This trail is intended to provide an approximate one-mile loop experience through various Piedmont ecosystems including oak-hickory forest, old field, and wetlands

Due to parking access and visibility, it is recommended that the primary lodge trailhead to access Robins Nest Lake and The Summit trail system be reconfigured, signed, and landscaped in such a way to improve visibility, increase aesthetic appeal and prevent erosion.

A looped boardwalk is recommended off the existing boardwalk at The Summit (Figure 27). This boardwalk is a primary programming location for The Summit environmental education programs. Providing a loop off the boardwalk with seating will increase the accessibility of the boardwalk to other Summit visitors while education programs are in progress.

Environmental Education Shelter

The proposed environmental education shelter ② will be an inviting multi-use shelter covering approximately 75 feet by 50 feet with a fireplace on one side. This shelter is sited to serve as a destination at the terminus of the drop-off area, centrally located to other campus facilities and adjacent to the open, multi-purpose field

Youth Cabins

Presently, the park has 10 youth cabins, each with an eight person capacity. Use of all 10 cabins allows for less than 90 students, due to the need for adult chaperones to accompany the students. Many school groups have 100 to 120 students total. Most of the time, all students in a group are not able to make it to the park, but with chaperones, total numbers at times can reach to 120. Some conference groups have requested more cabin space.

Requests also have been made for rooms with larger areas for handicapped students and their aides. The handicapped accessible hotel-style rooms in the cottages are not large enough for certain situations that require lifts in and out of shower areas.

In order to address these programmatic needs, two new youth cabins ④ are proposed within close proximity to the existing youth cabins. These cabins each should include a 10 person capacity and provide for universally-designed restrooms including lifts in and out of shower facilities. These additional cabins would guarantee housing in a similar overnight experience for up to 120 students and chaperones.

It is recommended that access to the youth cabins be retrofitted for code compliance.

Environmental Education Program / Classroom Building

The environmental education program staff currently uses offices within the roundhouse and does not have adequate indoor facilities for educational purposes. These uses require presence on The Summit Main Campus and proximity to other environmental education facilities including the open, multi-purpose field, the proposed environmental education shelter, and the proposed canopy walk (described in the following section). Developable land within The Summit Main Campus is limited, so the existing gym is proposed to be repurposed and / or expanded, using sustainable design principles. Redesign of this building should focus on improved use as an environmental education program classroom / office building ⑤ while still providing a large multi-purpose area for use by large groups on inclement weather days. This building is very conceptually illustrated in Figure 28. The

existing pool adjacent to the gym is nearing the end of its useful life. It is not a heavily used facility at The Summit and is in a prime location for development of the proposed environmental education program / classroom building. It is, therefore, recommended for removal and the site included in the repurposed area.

The proposed program of use for the building includes a multi-purpose room for use by large groups during inclement weather (capacity for 120 people, storage room for recreational equipment, tables, and chairs, associated restrooms, hard surface flooring), six environmental education classrooms, auditorium, three administrative offices with one shared meeting space, instructor workroom/office area, sta f restrooms, and one or two housekeeping closets. The total size is estimated to be on the order of 15,000 square feet.

Canopy Walkway

A universally-designed canopy walkway ⑥ is proposed with access just to the north of the environmental education building. This 'aerial trail' is envisioned as an opportunity to provide people of all abilities with the chance to see what it is like in the tree canopy, high above the ground. It will provide an innovative way of engaging people, especially children, in science through opportunities to view and study the plant and animal life of a canopy habitat. Views from above, down toward a person's normal vantage on the ground, can change one's perspective.

The canopy walk will be a function of The Summit, so it will have limited general public access. It does offer the opportunity of establishing itself as an icon for the park and its environmental education program.

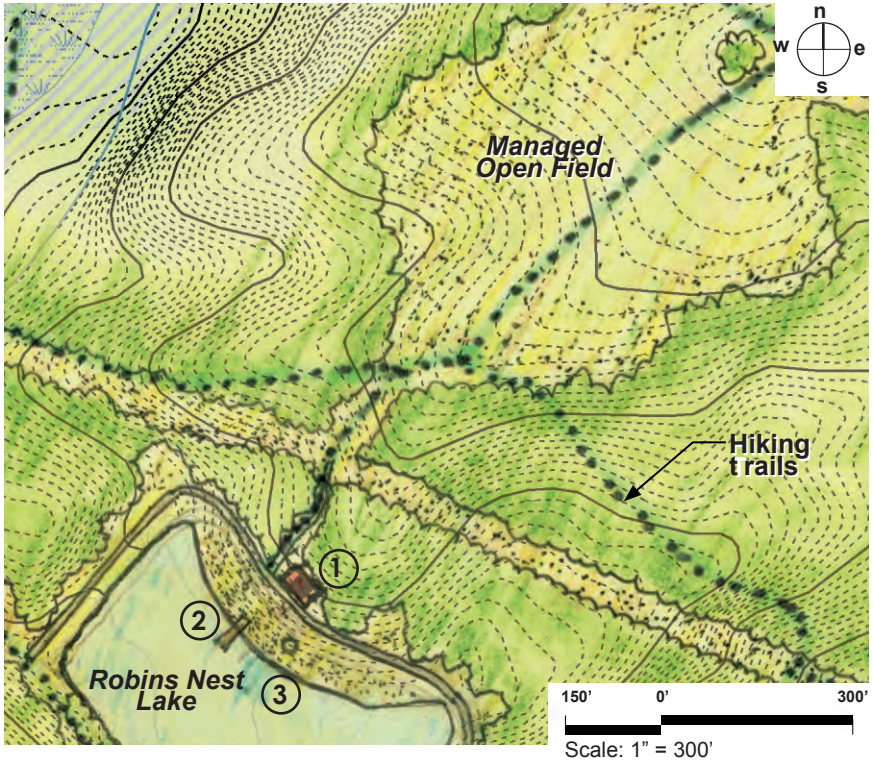
Canopy walkway precedent in d urham, n .C.

The route illustrated in Figure 28 is conceptual. The actual route should be selected to minimize ground and tree impact as well as removal of large branches or limbs.

Robins Nest Lake Vicinity

The existing lakeside shelter on the northeast side of Robins Nest Lake has reached the end of its useful life. It is recommended that this building be deconstructed, and any materials in good condition be re-used in other appropriate projects. Figure 29 illustrates a new outdoor classroom ① in the same general location as the lakeside shelter, providing access to existing potable water and sewer services. This new classroom is proposed as an open but covered shelter, sized for 30 to 40 people and five to six eight-person tables. A fireplace to one side, restrooms with potable wate , and an enclosed storage area are recommended for the shelter.

The existing pier on Robins Nest Lake is recommended to be reconstructed to allow continued use as a canoe put-in ②. A fire ring ③ is proposed also on this north bank of Robins Nest Lake.



f igure 29: r obins n est l ake v icinity

One accessible loading/unloading parking space is recommended for access to the outdoor classroom. A universally-designed pathway should be provided from the parking area to the classroom as well as to the canoe put-in and fire ring

Managed Open Field

An old field to the northeast of Robins Nest Lake is proposed to be maintained as an open field for the long-term.

Observatory

As a residential environmental education center offering formal programming for students, providing quality night time programming is essential. A small-scale observatory is proposed as a function of The Summit. The proposed location and associated access and parking are illustrated in Figure 30.

Astronomy is a secondary interpretive theme for the park as well as a current component of the environmental education curriculum. This is a valuable and vital component of The Summit's programming for several reasons.

Many participants do not have the opportunity to view a clear, unlit night sky and have never seen a truly starry sky, meteors, full constellations or planets. The concept of the clear sky as a sustainable natural resource can be developed and shown through astronomy programs. The students

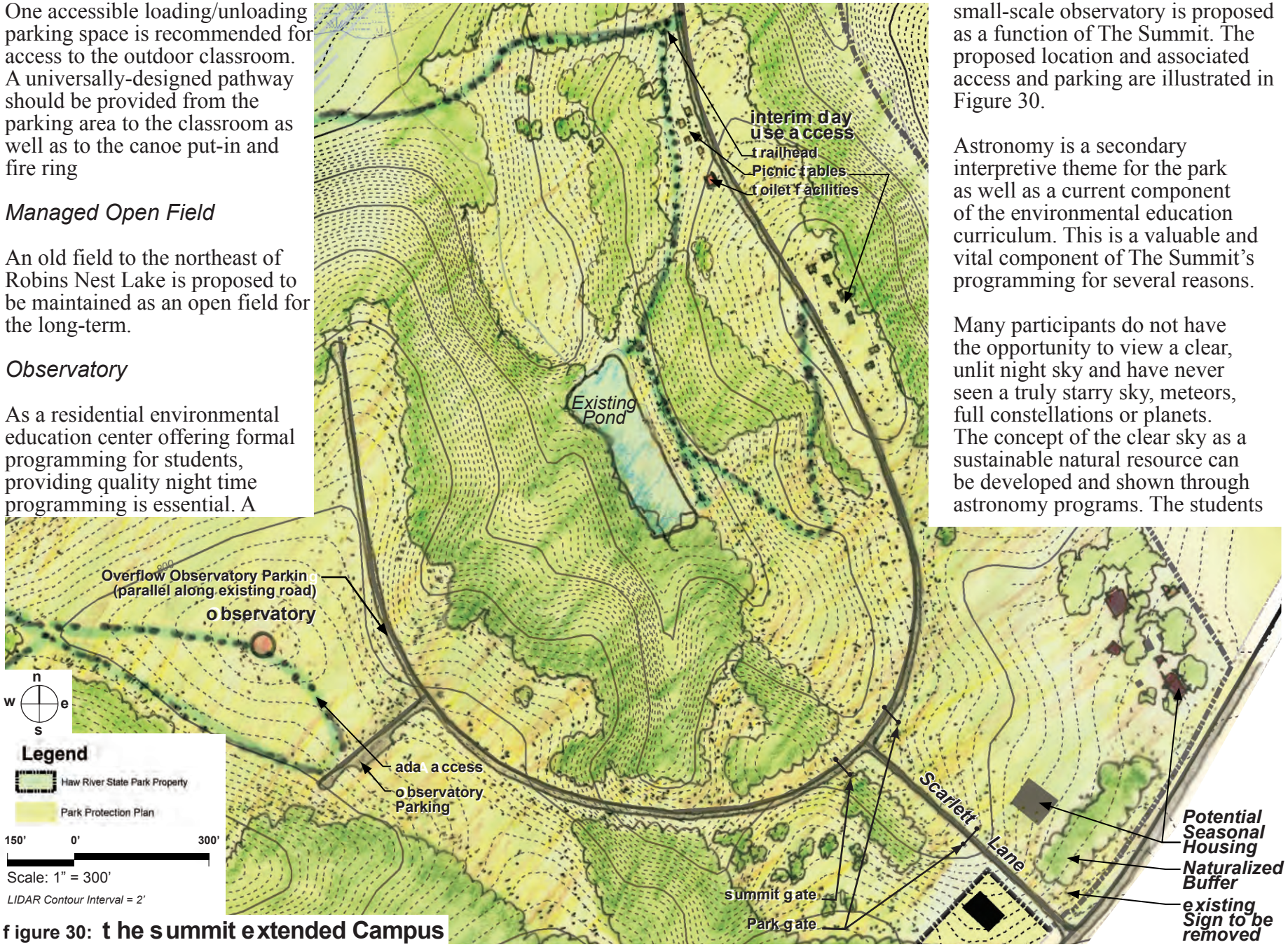


figure 30: the summit extended Campus

will come to understand the negative effects of light pollution and heat on the atmosphere and learn about international dark sky initiatives*. These concepts can be tied directly to other topics of sustainability of natural resources and applied to the student's day to day activities, therefore developing the student's understanding of responsibility to protect natural resources.

An observatory would increase The Summit's programming capability and improve the quality of its offerings. The observatory would provide a fixed location for the high quality telescope the park already owns; thus using staff time more efficiently in preparation and set up. It would also provide a safe, permanent location for the telescope, eliminating the risk of damage during transport.

This observatory is proposed primarily to support environmental education programming at The Summit. It will allow also for scheduled viewing by the general public, thus increasing the park's educational outreach.

Park Lighting

It is recommended that any lighting provided or renovated within the park use full cutoff fixtures while still providing for public safety. Use of this type of lighting results in no light emitted above horizontal, reducing impacts to viewing the night sky in the area.

Interim Public Day Use

Interim public day use access is proposed on The Summit Extended Campus. This proposed access will use the existing infrastructure of the former development to provide public access to the park until the proposed day use facilities can be completed in the Church Street Section.

As is illustrated in Figure 30, the interim facilities will include picnic tables, toilet facilities and trails accessible from a trailhead. This area will revert to a function of The Summit once traditional park facilities and public access are provided in the Church Street Section.

Seasonal Staff Housing

The Summit has a need for housing for seasonal employees. The small farm house on the southeast corner of the park property adjacent to Spearman Road is designated for this use. The partially constructed structure near the intersection of Scarlett Lane and Spearman Road also is designated as potential seasonal housing, pending further analysis of its condition. Both of these buildings are shown in Figure 30.

Other Elements

Another partially constructed structure from the former subdivision is located within The Summit Extended Campus area of the park (see Figure 6). This structure should be evaluated for re-use or removal.

The existing infrastructure and other elements associated with this former residential subdivision should be evaluated and removed when not deemed appropriate for the new park setting. For example, the subdivision sign should be removed from the entry to the area at Spearman Road. The existing open fields should be allowed to return to a natural state. A natural planted buffer near the entry to the area, as illustrated in Figure 30, is recommended.

New Trails

Opportunities for looped trails from The Summit Extended Campus connecting to The Summit Main Campus trails are conceptually drawn in Figure 31. It is recommended that these trails be phased in such a way as to facilitate looped trail access for interim day use initially and then connectivity to The Summit Main Campus trails at a later phase once the interim day use area reverts back to Summit use. As the location of these trails is further refined prior to construction, emphasis should be placed on establishing opportunities for interpretation of the natural communities in the area.

* For example, the mission of the International Dark-Sky Association is to preserve and protect the nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting.

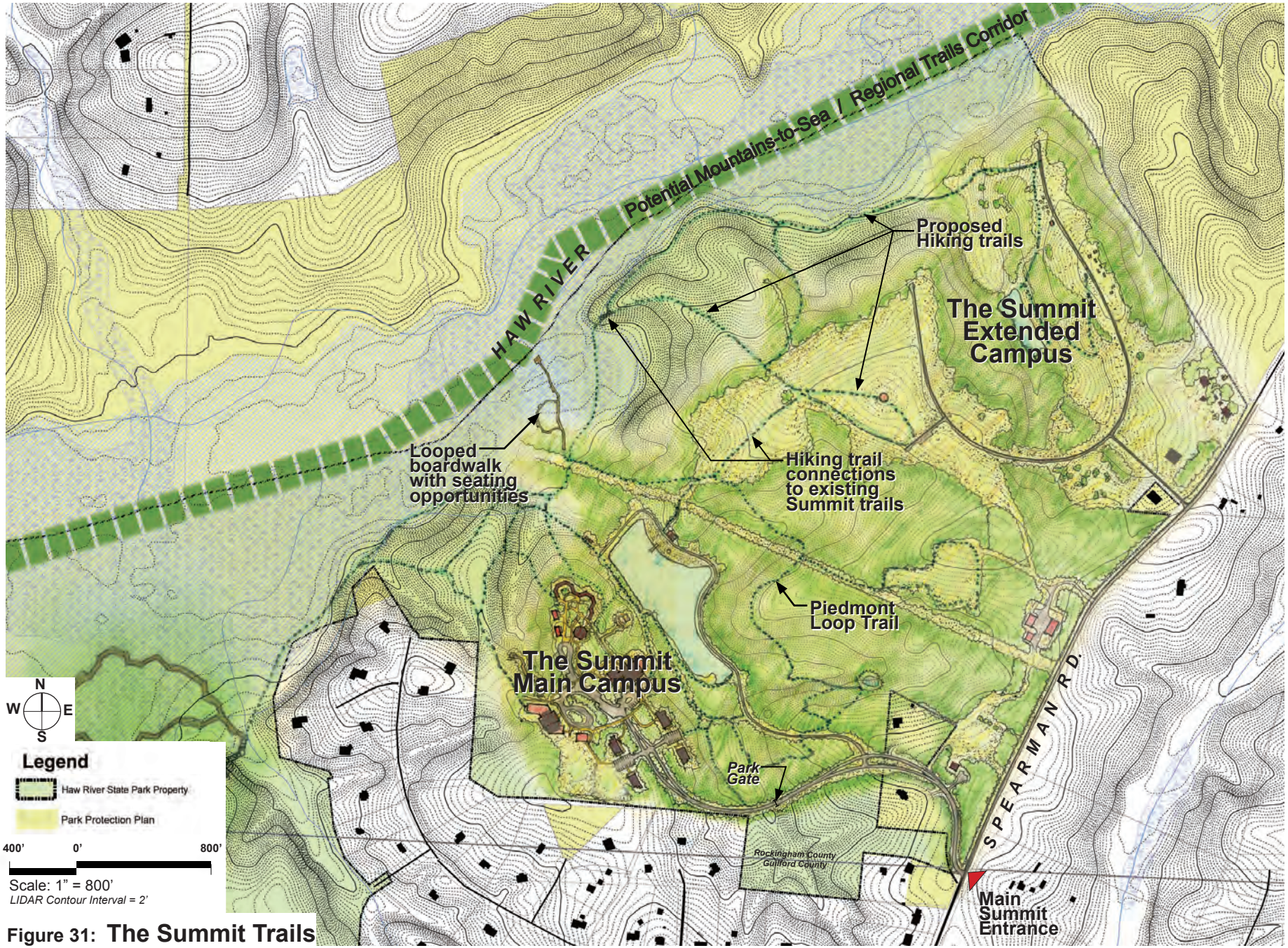


Figure 31: The Summit Trails

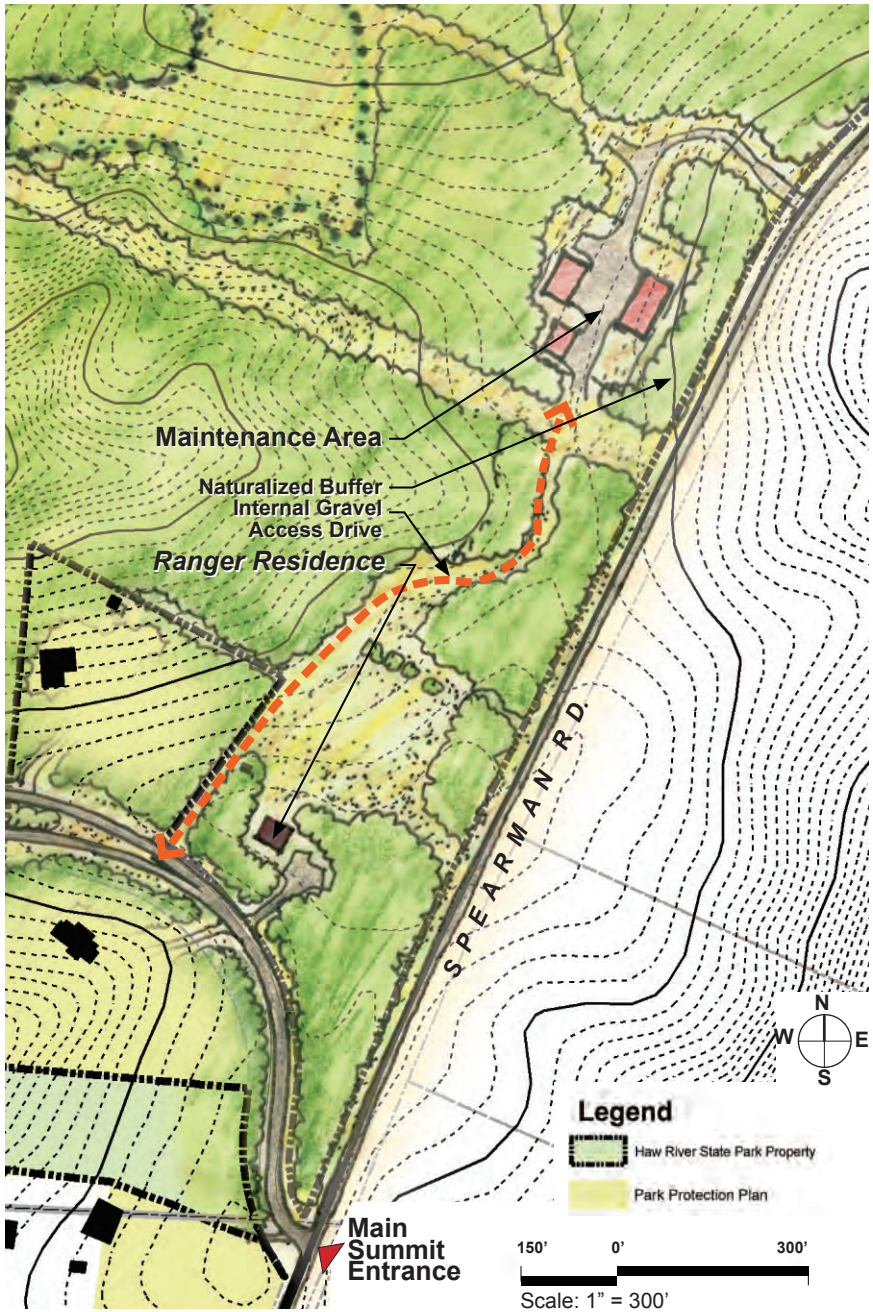


Figure 32: Maintenance Area

Relocated Maintenance Area

Figure 32 illustrates the location and schematic layout for the relocated maintenance area for The Summit. This site will have separate access from Spearman Road, as well as internal secondary access along an existing park path, shown by the orange dashed line in Figure 32. The designated area is approximately one and one-half acres for parking and supporting maintenance buildings.

This maintenance area is considered necessary in close proximity to The Summit Main Campus facilities to provide support for the overnight and dining facilities at The Summit, including storage of cottage supplies and park supplies. It is also intended to serve traditional state park maintenance needs for this area of the park.

This maintenance area will be enclosed by security fencing and will include two to three buildings. One of these buildings should include a six-bay equipment shed. The second should allow for storage of materials that support the functions of the overnight and dining facilities at The Summit. The location identified for the maintenance area allows space for expansion with a third similar-sized building.

The site will require electric, water, phone, and wastewater utilities. An appropriate septic area will be defined for the site prior to construction and will be sized appropriately to accommodate restrooms and equipment wash runoff.

Stormwater runoff will be directed through a filtering system, including an oil/water separator where appropriate, in order to cleanse the water prior to it entering the groundwater or surface waters of the site. Impervious surface will be kept to a minimum.

A natural planted buffer should provide screening of the proposed maintenance area from Spearman Road.

Connections to Regional Trails and the Larger Context

Figure 33 illustrates the overall concept for Haw River State Park, including opportunities to connect the park to proposed regional trails as well as opportunity areas for developing the land-dependent facilities described earlier in this section.

Haw River State Park, its lands and facilities will serve as one of the State's primary access points / nodes for the Mountains-to-Sea Trail and other regional trails. The conceptual corridor for the Mountains-to-Sea trail is illustrated by the thick, dashed green line in Figures 33 and 34. The exact location of the Mountains-to-Sea Trail through Haw River State Park is dependent upon future land

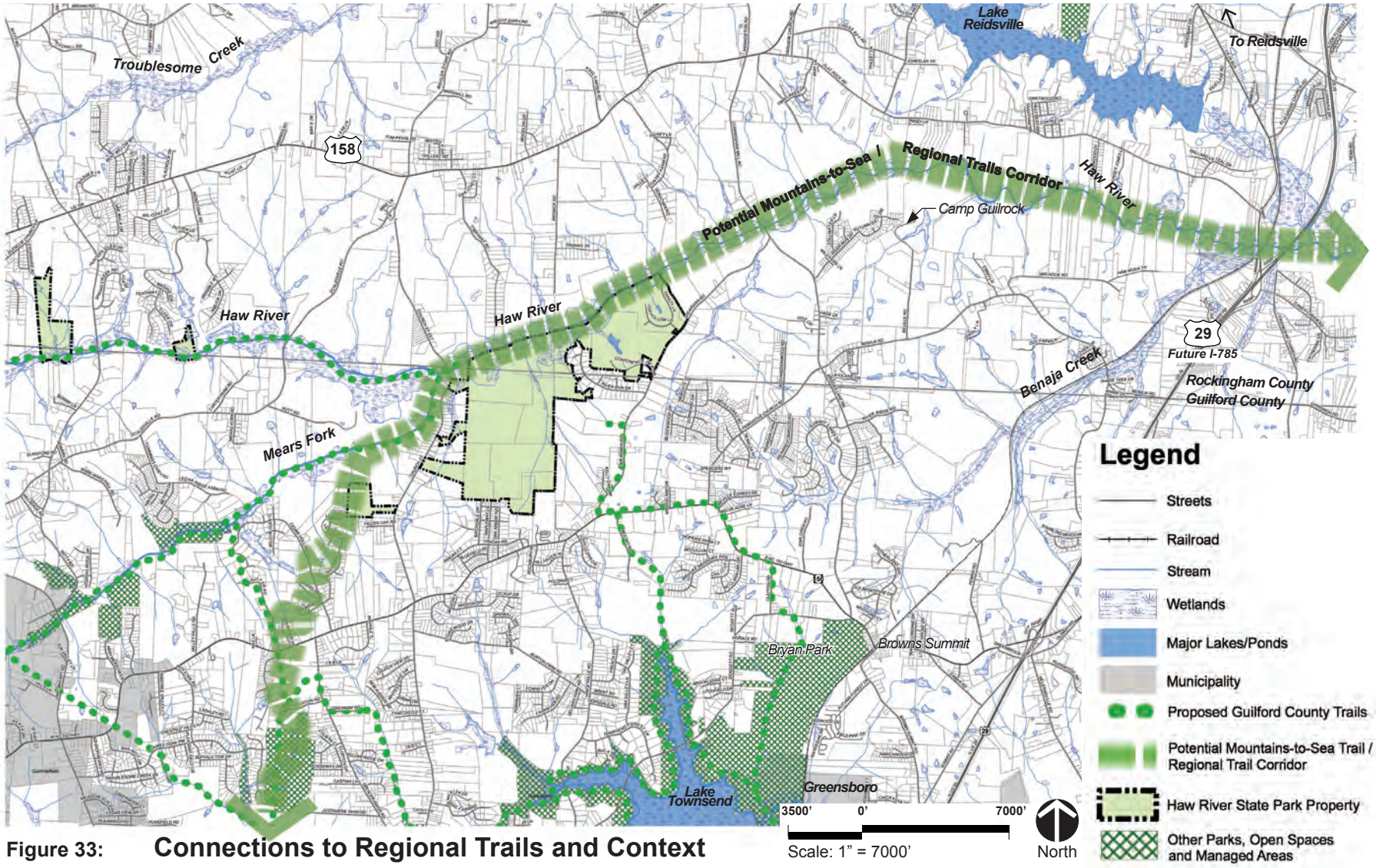


Figure 33: **Connections to Regional Trails and Context**

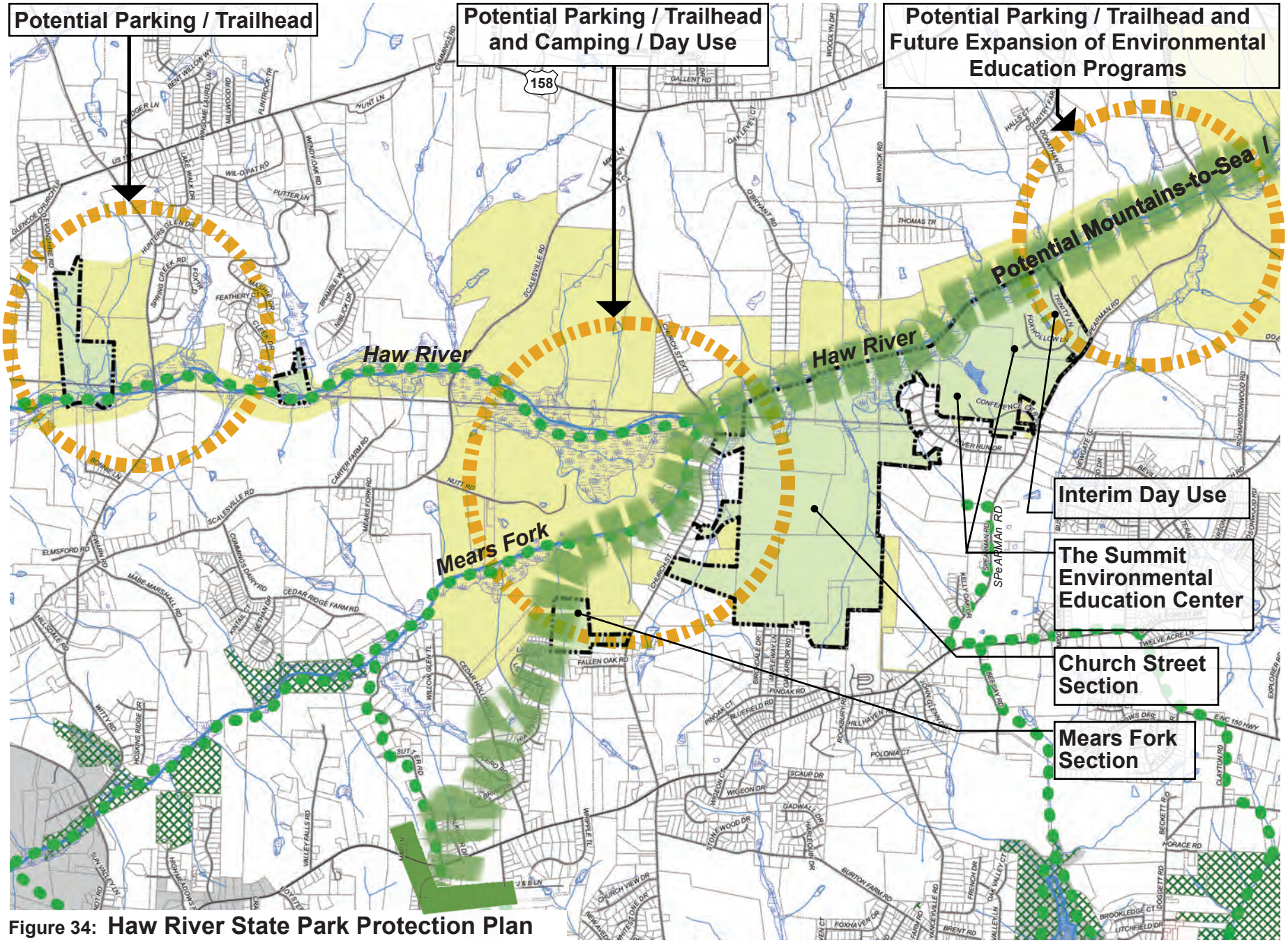
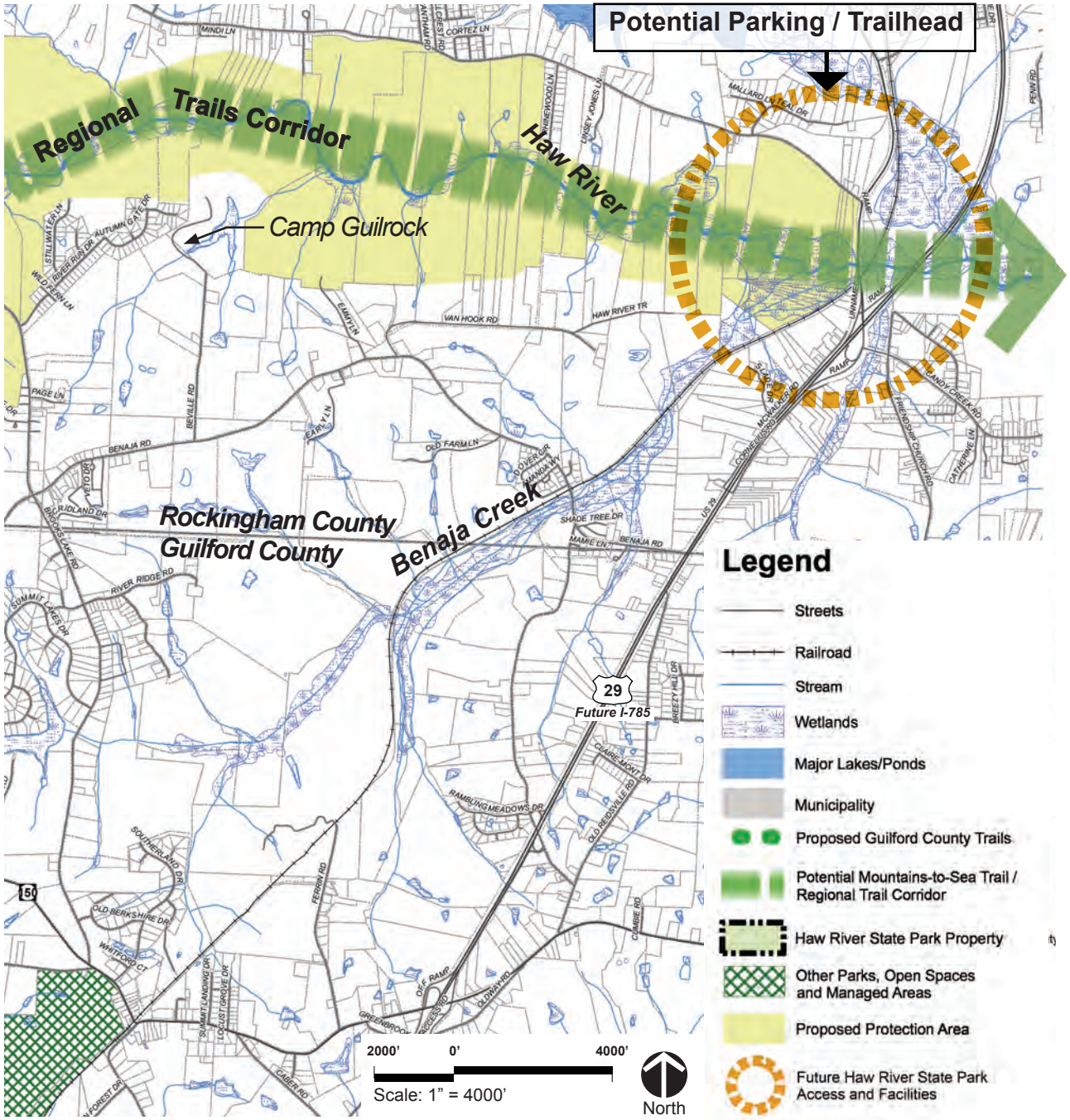


Figure 34: **Haw River State Park Protection Plan**



acquisitions and trail connections south to Greensboro's existing Watershed Trails System and east to the U.S. 29 crossing of the Haw River.

As was described in a previous section, Guilford County currently has extensive long-term plans for a greenway system across the county, including connections to Haw River State Park. These trails, shown in a thinner, dotted line in Figures 33 and 34, are planned to follow Mears Fork Creek from the southwest; the Haw River Trail will follow the Haw River from the east; and other greenways are planned to approach the park from the south from Lake Townsend and Bryan Park on the north side of Greensboro.

Figure 34 represents future Haw River State Park access and facilities as dashed orange circles, generally located where north / south roads cross the Haw River. Long-term plans, beyond the interim day use presented earlier in this document, include expansion of environmental education programs for The Summit to the east toward Cunningham Mill Road.

Protection Plan

Haw River State Park was authorized to protect natural and cultural resources in the upper reaches of the river corridor. Multiple factors or objectives are used to determine if a property is included in the state

park protection plan. For Haw River State Park the land protection objectives are:

- Protection of significant natural resources such as significant natural heritage areas, rare species habitat, important wetlands and floodplains along the river or significant land identified in the biodiversity assessment o the conservation planning tool.
- Protection of water quality in the Haw River and its tributaries.
- Protection of high ground along the river corridor to support an extensive trail system.
- Protection of larger acreage tracts strategically located to provide both access to the trail system and supplemental visitor facilities.
- Protection of significant cultural resources
- Land for connections to state-wide and regional trails and buffers to improve management of park land.

Figure 34 illustrates the overall protection plan for Haw River State Park. Planned protection needs are shown in light yellow. As of January 1, 2010, Haw River State Park contains 1,374 acres. An additional +/-5,846 acres are included in the park protection plan, which brings the total planned size of Haw River State Park to +/-7,220 acres.

Setting land protection priorities includes the significance of the resources on the property, the proximity of the property to existing state park ownership, and why the property is needed for the state park.

SUSTAINABLE DESIGN IN A STATE PARk MASTER PLAN

The N.C. Department of Environment and Natural Resources' Green Building Policy, drafted by the N.C. Department of Environment and Natural Resources Sustainability Team and signed by former Secretary Bill Ross, directs the department and its divisions "to take real and permanent steps to integrate sustainable and green building practices for projects in capital construction, facility renovations, facility leasing, land development, landscaping and facility purchases."

All components of the master plan have been evaluated and designed based on principles of sustainable design/green design with reference to the Leadership in Energy and Environmental Design (LEED®) design criteria. LEED® is a rating system for green design first developed in 1999 by the U.S. Green Building Council. According to the U.S. Green Building Council, "Green design not only makes a positive impact on public health and the environment, it also reduces operating costs, enhances building and organizational marketability, potentially increases occupant productivity, and helps create a sustainable community (*U.S. Green Building Council, 2005*)."

Though a project does not have to be rated through the LEED® system to be considered 'green,' the system provides a well-defined baseline from which to begin conversations in design regarding how to develop any new construction project or major renovation in a manner that will be sustainable. The N.C. Division of Parks and Recreation staff directive states, "The Division is to pursue LEED® certification through the U.S. Green Building Council s LEED® Green Building Rating System for all new, or significantly renovated, buildings having 5,000 square feet or more. For buildings less than 5,000 square feet, project team members are to be familiar with the use of LEED® as a tool to help guide the project."

Much of the LEED® system is focused on structures and will be addressed more thoroughly at later design and development phases for buildings.

LEED® accreditation is based on six areas of sustainability. These include sustainable site, water efficienc , energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process. Further description of these areas in the context of Haw River State Park follows.

Sustainable Site

For this master plan, specific attention has been focused on selection of sustainable sites for future development. Site selection for buildings and parking areas has been based on areas with the following qualities:

- Slopes less than 10 percent
- Areas more than 50 feet from a water body (construction should not take place within a 100 feet buffer from perennial streams whenever practicable)
- Areas more than 100 feet from a wetland as defined by the National Wetlands Inventory *
- Land that is specifically identified as habitat for any specie on Federal or State threatened or endangered lists.

Other focus areas for sustainable sites, described below, include:

- Use low impact design strategies
  - Reduce imperviousness
  - Conserve natural resources and ecosystems
  - Maintain natural drainage courses
  - Reduce use of pipes for stormwater management
  - Minimize clearing and grading
- Minimize soil erosion, waterway sedimentation, and airborne particulate/dust generation during construction
- Disperse stormwater management facilities/structures uniformly across a site
- Mimic natural systems for stormwater quality control
- Minimize heat island effects
- Minimize light pollution.

During the design and construction phases of any project in the park, special attention will be focused on protecting the site from sedimentation, soil erosion, as well as airborne particulate/dust

* Further design and development will require evaluation for wetlands based on 40 CFR Parts 230-233 and Part 22.

generation during the construction process. Use of best available technology for sedimentation and erosion control is critical.

Devices and structures used for sedimentation and erosion control will be maintained in good working condition at all times during construction.

Appropriate design for stormwater is important in maintaining a sustainable site. Not only should stormwater design meet

Electric golf carts

state and local codes, it should go beyond these regulations to ensure stormwater quality as the water re-enters the surface and subsurface water cycles. Water quantity controls will minimize the potential for downstream flooding and erosion from site development in the future. Water quality controls, performed by structures such as bioretention areas, will help to maximize sequestration of pollutants to the site of creation as well as protecting areas downstream from these pollutants. All stormwater should flow through a vegetated upland prior to entering a stream or wetland (*N.C. Wildlife Resources Commission, 2002*).

During construction, all equipment will be kept out of streams as much as practicable. Also, utility lines and infrastructure will be installed outside of stream buffers.

The heat island effect is defined by the U.S. Green Building Council as "thermal gradient differences between developed and undeveloped areas" (*U.S. Green Building Council, 2005*). This effect can have negative impact on microclimates as well as human, animal, and plant habitats. Heat islands are most often caused by large areas of unshaded pavement and large roof areas. The master plan begins to address this issue through identification of overflow parking areas that use pervious and plantable materials. Additional attention can be focused on this issue in design and construction phases of a development project through, for example, provision of ample shade in parking areas, use of high reflectance materials for paving (selected with attention to potential glare issues for those with visual disabilities), minimization of structure footprints and therefore roof areas, use of roofing materials with a high reflectance, and/or use of a vegetated roof

Water Efficienc

Efficient use of water will be considered in every phase of a project for both the site and the buildings. Use of innovative wastewater technologies when possible and water use reduction, through the use of low-flow toilets, showers and other means, also are considered sustainable design practices.

Use of cisterns to harvest rainwater from roof structures can provide water for uses including, but not limited to, landscape irrigation and toilet flushing

During the design phase of any project at the park, sustainable design principles will dictate design of water efficient landscaping, with an ideal focus toward landscaping requiring no potable water use and no irrigation beyond plant establishment.

Energy Efficienc

Green building practices cost less to operate and maintain. They also provide an opportunity to use natural resources efficiently and

responsibly and to reduce the site and building's overall impact on the environment.

Buildings should be optimized for energy-efficienc , including siting buildings with an east-west axis, where practicable, to optimize for passive solar design and the use of broad roof overhangs to block mid-day summer sun.

Use of on-site renewable energy sources where possible, including opportunities for solar energy, hydropower, and/or wind power, will make the development more self-sufficient and reduce economic and environmental impacts from fossil fuel use. Energy-efficient heating and cooling systems, such as geothermal/ground source wells, use the constant earth temperature to heat and cool the workplace.

The environmental education building / classroom building, visitor center, and any other park buildings will be designed for energy-efficienc . Solar energy or other renewable energy options both for heating water and providing electricity will be explored whenever possible.

Another means of ensuring energy-efficiency as defined by LEED® includes increasing energy performance and commissioning of buildings to ensure that systems are designed and perform in an energy-efficient manne .

Recycled lumber

Materials and Resources

Sustainable design and construction ensures waste reduction through the design of the building and the construction process. When waste is produced, recycling should be a priority. Reuse of existing building material also should be prioritized.

Design for use of new building materials in the construction process should focus on those materials utilizing recycled content. When recycled content is not possible, products made from rapidly renewable products are desirable and resource friendly. Wood certified using the Forest Stewardship Council s Principles and Criteria will promote sustainable forestry practices.

Ideally, materials will be sourced from producers and manufacturers in the surrounding region. A focus on indigenous materials can replicate a 'local vernacular' as well as minimize environmental impacts from transportation and add to local economic prosperity.

Indoor Environmental Quality

A focus on indoor air quality enhances the health and experience of building occupants. Many aspects of sustainable indoor air quality performance can be addressed by a qualified designe , such

Mulching toilet

as adequate ventilation and use of low-emitting material selection (e.g. paints, sealants, adhesives, etc.).

Indoor environmental quality also addresses issues related to lighting controls, thermal comfort, daylighting, and views.

Innovation and Design Process

Sustainable design practitioners can be precedent setters for new, innovative practices in design and construction of sites and buildings. The N.C. Division of Parks and Recreation can set guidelines for all new construction at Haw River State Park based on successes displayed and monitored in other projects. The environmental education building proposed in this master plan will provide opportunities for educating the general public and other designers about the ecological, cultural, and economic benefits of green design and construction.

Technologies of Particular Interest

The N.C. Division of Parks and Recreation staff directive on sustainable and green building practices indicates a particular interest in sustainable and green building technologies that address the following:

- Ecological site design; on-site erosion control, water purification/pollution reduction, and stormwater management
- Transportation; promoting bicycle, pedestrian, and transit use where possible.
- Waste reduction; building reuse, job site recycling, and efficient use of materials.
- On-site management of sewage and organic wastes, such as graywater systems and biological wastewater treatment. It is recommended that when the existing wastewater treatment facility at the park reaches the end of its useful life, that a more innovative system, potentially using small constructed wetland systems be considered. This could provide a significant addition to the environmental education program as well.
- Energy efficiency; efficient thermal envelopes, efficient spa and water heating, lighting, controls and monitoring, and appliances.
- Renewable energy; photovoltaics, geothermal pumps, wind turbines.
- Water efficienc , both domestic and irrigation, including rainwater harvesting for irrigation and toilet flushing. Consider waterless urinals in all applications.
- Materials and resources; durable building envelopes and long-lived materials or assemblies, recycled-content materials, safer, less toxic materials, such as alternatives to CCA-treated wood, innovative application of natural materials (characterized by low embodied energy, local availability, good performance, biodegradable, safe, esthetic) such as straw, earth, and other composites.
- Indoor environmental quality; pollution reduction, worker and occupant safety, air cleaning, humidity control, and thermal comfort.
- Operations and maintenance; monitoring energy, water, waste, air quality, and transportation use along with resource-efficient operation practices.

PRo Po SED CAPITAL IMPRov EMENTS WITH Co ST ESTIMATES

Project	Cost / Percentage of Subtotal
Subtotal for the Greater Park	**$7,614,221**
1. Circulation, Access and Infrastructure	26.4%
2. Maintenance Area	14.9%
3. Day Use Improvements / General Development and Pedestrian Trails	21.5%
4. Visitor Center	26.2%
5. Group Camping	8.6%
6. Demolition	2.3%
Subtotal for The Summit Environmental Education Center	**$5,514,490**
1. Circulation and Access (Vehicular)	8.7%
2. Circulation and Access (Pedestrian)	15.4%
3. Maintenance Facility	12.2%
4. New Facilities or Improvements to Existing Facilities	61.4%
5. Interim Day Use Area Improvements / General Development	2.4%
Subtotal for Land-Dependent Facilities	**$6,593,416**
1. Circulation and Access	33.9%
2. Backpack Camping	1.6%
3. Tent-and-Trailer Camping	53.6%
4. Ranger Residence (estimate for renovation)	1.1%
5. Cleanup and Demolition	2.3%
6. Trailhead and Mountains-to-Sea Trail Connections	7.5%
Total Capital Improvements Needs for Haw River State Park	**$19,722,127**

These costs are based upon 2009 construction values using recent bid tabulations with cross reference to RS Means Construction Cost Data. These estimates are to be used for budgeting purposes only and not for construction. This estimate reflects a master planning level of design and does not account for material availabilit , escalation, or the economy of construction at the time of actual construction.

PHASING PLAN

As described in an earlier section, all proposed capital projects in the state parks system are individually scored and assigned priority by the park before being combined with projects for other state parks. These priorities are periodically re-evaluated. This will be the case for new infrastructure (roads, utilities, etc.), facilities, or trails at Haw River State Park. The time frame for building new facilities will depend on how each new project is evaluated in relation to others in the state.

Interim day use in The Summit Extended Campus will be constructed to allow the public to experience a portion of the park before the more capital-intensive projects in the greater park are funded. Looped trails will be provided with access from a trailhead in this interim day use area. These trails, as conceptually illustrated in a previous section, will be phased such that desired separation between general public use and The Summit uses are maintained.

The interim day use area will be phased out and the area converted to The Summit use once day use facilities are provided in the Church Street Section of the park. At that time, final connections between trails in The Summit Extended Campus to existing trails around Robins Nest Lake and The Summit Main Campus can be completed to facilitate connectivity of The Summit's entire trail system.

Several facilities for the greater park, as described in previous sections, are land-dependent at this time. These will be phased into the park once suitable land has been acquired and funds are in place to develop these facilities. These include tent-and-trailer camping as well as backpack camping. Two additional group camping sites could be expanded at the proposed area in the Church Street Section if demand is high. Otherwise, to improve preservation of the forest setting in the Church Street Section, it is recommended that these two additional group camping sites be provided on more suitable land, as identified through acquisitions, in the future.

STAFFING REq UESTS

With the construction of facilities or the acquisition of land, new staff will be needed to assist in supporting maintenance, operations, public safety and visitor use. The staffing requests shown below are based on levels needed to support the various types of existing and planned uses in the greater park and The Summit.

The Entire Park *(serving both The Greater Park and The Summit)*

Existing Staff:

Permanent: (1) Park Superintendent - Journey (reclass to Advanced)
(1) Maintenance IV

Proposed Staff:

None

The Greater Park

Existing Staff:

None

Proposed Staff:

Permanent: **(1) Park Ranger - Advanced**
Seasonal: **(3) General Utility Workers**
Facilities supported: Visitor Center; Day Use; Camping; Hiking Trails; Boardwalk; Parking

Permanent: **(1) Park Ranger - Journey**
Seasonal: **(1) General Utility Worker**
Facilities supported: Mountains-to-Sea Trail; Outlying / Remote Park Land

Permanent: **(1) Maintenance III**
(1) Maintenance II
Facilities supported: Visitor Center; Day Use; Camping; Hiking Trails; Boardwalk; Parking; Maintenance Area

Permanent: **(1) Office Assistant IV**
Seasonal: **(2) General Utility Workers**
Facilities supported: Visitor Center

Regular type = existing staff
Bold type = proposed staff

Black = permanent full-time
Gray = seasonal

The Summit

Existing Staff:

Permanent:
(1) Park Ranger – Journey
(1) Parks Chief Naturalist
(1) District Interpretation and Education Specialist
(1) Food Services Supervisor IV
(1) Food Services Supervisor II
(1) Cook II
(1) Housekeeping Supervisor
(1) Office Assistant IV (reclass from OAIII)
(1) Administrative Assistant

Seasonal:
(5) Park Technicians
(11) Environmental Education Instructors
(13) General Utility Workers

Proposed Staff:

Permanent: **(1) Park Ranger - Advanced**
Seasonal: **(2) Park Technicians**
Facilities supported: The Lodge; Cottages; Youth Cabins; Environmental Education Building and Shelter; Canopy Walk; Roundhouse; Amphitheaters; Outdoor Classroom; Hiking Trails; Boardwalk; Observatory; Robins Nest Lake; Parking; Interim Day Use

Permanent: **(2) Natural Science Curator I**
Seasonal: **(2) Environmental Education Instructors**
Facilities supported: Youth Cabins; Environmental Education Building and Shelter; Canopy Walk; Roundhouse; Amphitheaters; Outdoor Classroom; Hiking Trails; Boardwalk; Observatory; Open Recreation Field

Permanent: **(1) Cook II**
Seasonal: **(1) General Utility Worker**
Facilities supported: Kitchen and Dining Room (Food Services)

Permanent: **(1) Maintenance III**
(2) Maintenance II
Facilities supported: The Lodge; Cottages; Youth Cabins; Environmental Education Building and Shelter; Canopy Walk; Roundhouse; Amphitheaters; Outdoor Classroom; Hiking Trails; Boardwalk; Observatory; Robins Nest Lake; Parking; Interim Day Use; Maintenance Area (The Summit); Associated Grounds

Permanent: **(1) Administrative Office II**
Facilities supported: The Lodge; Cottages; Youth Cabins

Regular type = existing staff
Bold type = **proposed staff**

Black = permanent full-time
Gray = seasonal

ACk No WLEDGEMENTS

Master Plan Project Team

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Haw River State Park Advisory Committee

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Jenn Phillips, Secretary
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Senator Don Vaughan, N.C. Senate, District 27

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Guilford County Open Space
Friends of Haw River State Park

Planners and staff with Guilford County and Rockingham County who assisted with information and data.

All the concerned individuals who attended the public meeting and provided input.

Photo Credits

All photos provided by Haw River State Park or taken by Swanson and Associates, P.A.

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APPENDICES

Appendix A - Summary of Community Input and Public Comments

Public Comments in response to public meeting and internet posting of draft Master Plan in October 2009

Comment sheets received:	23	(21 returned at meeting; 2 mailed in)
E-mails received:	30	
Total Responses	*53*	

Subject	***# of Responses***
General Comments	6
Consider Additional Preservation/Less Development	22
Consider Hiking Trails	15
Consider Biking or Multi-Use Trails	24
Consider Regional Connections	8
Consider Cultural History	4
Consider night sky / dark sky	7
Considerations on Camping	8
Other uses - dog park / horse trails / disk golf / paddle access/horseshoes	5
Operational - volunteer labor / boundary / programming / other	12

Public Comments in response to revisions of draft Master Plan posted on the internet in December 2009

E-mails received:	8
MST Social Networking site comments:	4
Total Responses	*12*

Subject	***# of Responses***
Consider Biking or Multi-Use Trails	3
Considerations on Camping	9

Appendix B - State Parks Act
(North Carolina General Statutes - ARTICLE 2C)

§ 113-44.7. Short title.
This Article shall be known as the State Parks Act. (1987, c. 243.)

§ 113-44.8. Declaration of policy and purpose.
(a) The State of North Carolina offers unique archaeologic, geologic, biological, scenic, and recreational resources. These resources are part of the heritage of the people of this State. The heritage of a people should be preserved and managed by those people for their use and for the use of their visitors and descendants.
(b) The General Assembly finds it appropriate to establish the State Parks System. This system shall consist of parks which include representative examples of the resources sought to be preserved by this Article, together with such surrounding lands as may be appropriate. Park lands are to be used by the people of this State and their visitors in order to promote understanding of and pride in the natural heritage of this State.
(c) The tax dollars of the people of the State should be expended in an efficient and e fective manner for the purpose of assuring that the State Parks System is adequate to accomplish the goals as defined in this Article.
(d) The purpose of this Article is to establish methods and principles for the planned acquisition, development, and operation of State parks. (1987, c. 243.)

§ 113-44.9. Definitions
As used in this Article, unless the context requires otherwise:
(1) “Department” means the Department of Environment and Natural Resources.
(2) “Park” means any tract of land or body of water comprising part of the State Parks System under this Article, including existing State parks, State natural areas, State recreation areas, State trails, State rivers, and State lakes.
(3) “Plan” means State Parks System Plan.
(4) “Secretary” means the Secretary of Environment and Natural Resources.
(5) “State Parks System” or “system” mean all those lands and waters which comprise the parks system of the State as established under this Article. (1987, c. 243, s. 1; 1989, c. 727, s. 218(50); 1989 (Reg. Sess., 1990), c. 1004, s. 19(b); 1997-443, s. 11A.119(a).)

§ 113-44.10. Powers of the Secretary.
The Secretary shall implement the provisions of this Article and shall be responsible for the administration of the State Parks System. (1987, c. 243.)

§ 113-44.11. Preparation of a System Plan.
(a) The Secretary shall prepare and adopt a State Parks System Plan by December 31, 1988. The Plan, at a minimum, shall:
(1) Outline a method whereby the mission and purposes of the State Parks System as defined in G.S. 13-44.8 can be achieved in a reasonable, timely, and cost-effective manner;
(2) Evaluate existing parks against these standards to determine their statewide significance
(3) Identify duplications and deficiencies in the current State Parks System and make recommendations for correction;
(4) Describe the resources of the existing State Parks System and their current uses, identify conflicts created by those uses, and propose solutions to them; and
(5) Describe anticipated trends in usage of the State Parks System, detail what impacts these trends may have on the State Parks System, and recommend means and methods to accommodate those trends successfully.
(b) The Plan shall be developed with full public participation, including a series of public meetings held on adequate notice under rules which shall be adopted by the Secretary. The purpose of the public meetings and other public participation shall be to obtain from the public:
(1) Views and information on the needs of the public for recreational resources in the State Parks System;
(2) Views and information on the manner in which these needs should be addressed;
(3) Review of the draft plan prepared by the Secretary before he adopts the Plan.
(c) The Secretary shall revise the Plan at intervals not exceeding five years. Revisions to the Plan shall be made consistent with and under the rules providing public participation in adoption of the Plan. (1987, c. 243.)

§ 113-44.12. Classification of parks resources
After adopting the Plan, the Secretary shall identify and classify the major resources of each of the parks in the State Parks System, in order to establish the major purpose or purposes of each of the parks, consistent with the Plan and the purposes of this Article. (1987, c. 243.)

§ 113-44.13. General management plans.
Every park classified pursuant to G.S. 13-44.12 shall have a general management plan. The plan shall include a statement of purpose for the park based upon its relationship to the System Plan and its classification. An analysis of the major resources and facilities on hand to achieve those purposes shall be completed along with a statement of management direction. The general management plan shall be revised as necessary to comply with the System Plan and to achieve the purposes of this Article. (1987, c. 243.)

§ 113-44.14. Additions to and deletions from the State Parks System.
(a) If, in the course of implementing G.S. 113-44.12 the Secretary determines that the major purposes of a park are not consistent with the purposes of this Article and the Plan, the Secretary may propose to the General Assembly the deletion of that park from the State Parks System. On a majority vote of each house of the General Assembly, the General Assembly may remove the park from the State Parks System. No other agency or governmental body of the State shall have the power to remove a park or any part from the State Parks System.
(b) New parks shall be added to the State Parks System by the Department after authorization by the General Assembly. Each additional park shall be authorized only by an act of the General Assembly. Additions shall be consistent with and shall address the needs of the State Parks System as described in the Plan. All additions shall be accompanied by adequate authorization and appropriations for land acquisition, development, and operations. (1987, c. 243.)

§ 113-44.15. Parks and Recreation Trust Fund.
(a) There is established a Parks and Recreation Trust Fund in the State Treasurer's Office. The Trust Fund shall be a nonreverting special revenue fund consisting of gifts and grants to the Trust Fund, monies credited to the Trust Fund pursuant to G.S. 105-228.30(b), and other monies appropriated to the Trust Fund by the General Assembly.
(b) Funds in the Trust Fund are annually appropriated to the North Carolina Parks and Recreation Authority and, unless otherwise specified by the General Assembly or the terms or conditions of a gift or grant, shall be allocated and used as follows:
(1) Sixty-five percent (65%) for the State Parks System for capital projects, repairs and renovations of park facilities, and land acquisition.
(2) Thirty percent (30%) to provide matching funds to local governmental units on a dollar-for-dollar basis for local park and recreation purposes. These funds shall be allocated by the North Carolina Parks and Recreation Authority based on criteria

patterned after the Open Project Selection Process established for the Land and Water Conservation Fund administered by the National Park Service of the United States Department of the Interior.

(3) Five percent (5%) for the Coastal and Estuarine Water Beach Access Program. Of the funds appropriated to the North Carolina Parks and Recreation Authority from the Trust Fund each year, no more than three percent (3%) may be used by the Department for operating expenses associated with managing capital improvements projects, acquiring land, and administration of local grants programs.

(c) The North Carolina Parks and Recreation Authority shall report on an annual basis to the Joint Legislative Commission on Governmental Operations, the appropriations committees of the House of Representatives and the Senate, and the Fiscal Research Division on allocations from the Trust Fund.(1993 (Reg. Sess., 1994), c. 772, s. 1; 1995, c. 456, s. 2; 1995 (Reg. Sess., 1996), c. 646, s. 20.)

Appendix C - Existing Utilities Map for The Summit Main Campus